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# CPU

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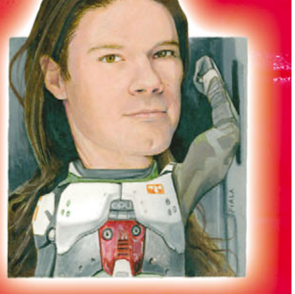

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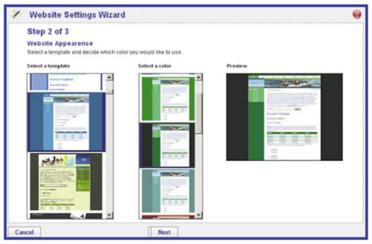

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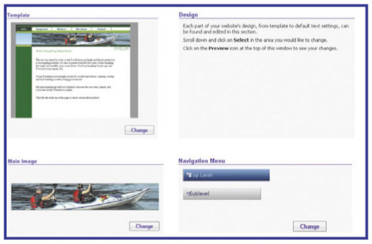

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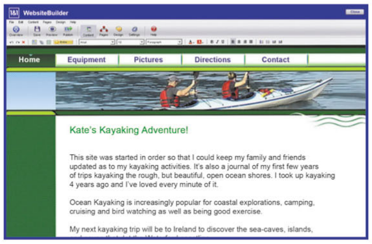

Kate's Kayaking Adventure!

This site was started in order so that I could keep my family and friends updated as to my kayaking activities. It's also a journal of my first few years of trips kayaking the rough, but beautiful, open ocean shores. I took up kayaking 4 years ago and I've loved every minute of it.

Ocean Kayaking is increasingly popular for coastal explorations, camping, cruising and bird watching as well as being good exercise.

My next kayaking trip will be to Ireland to discover the sea-caves, islands,

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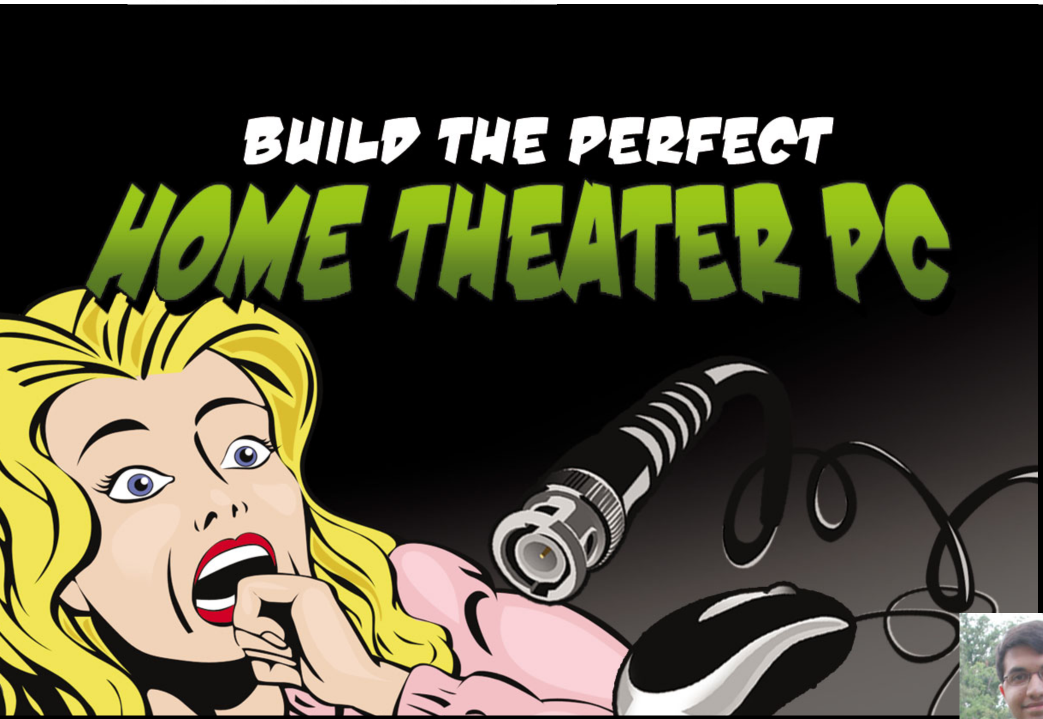

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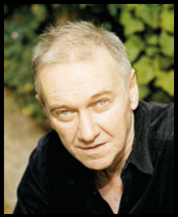
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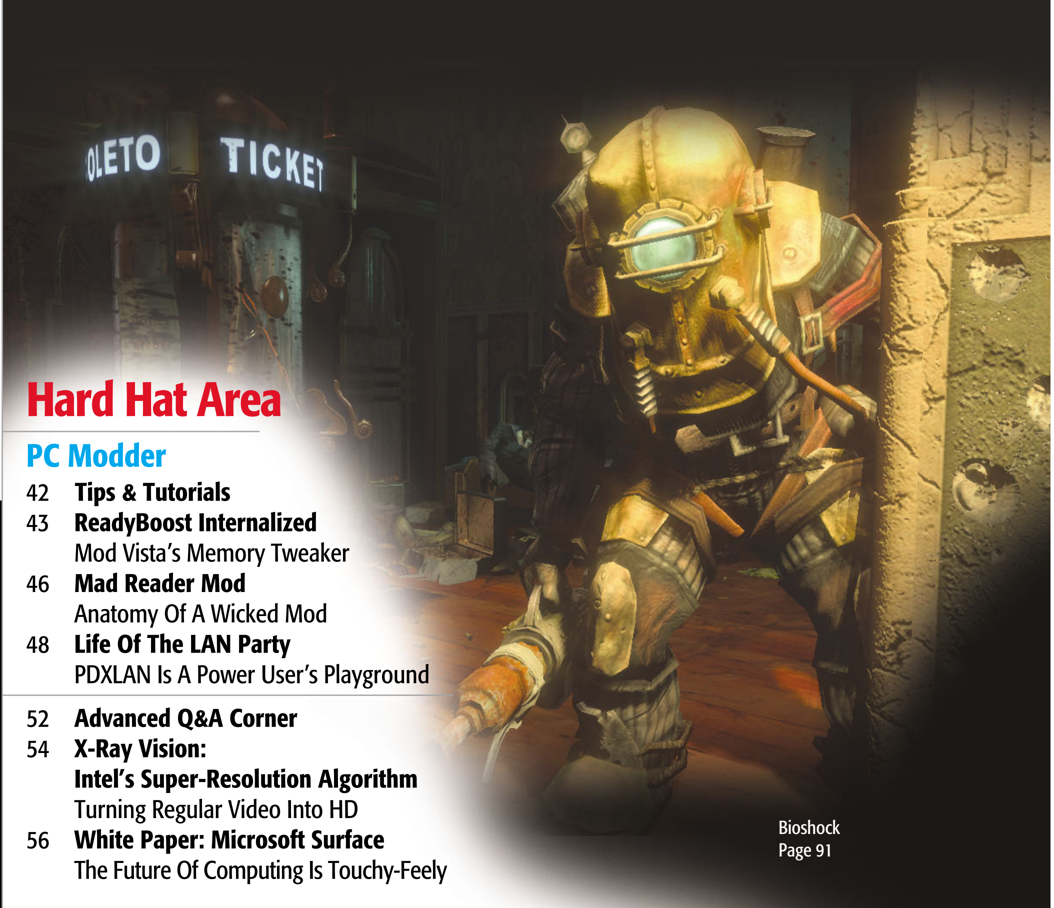

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# Editor's Note

By the time you read this, the Great iPhone Price Cut of '07 and all its attendant nastiness will be old news. Actually, it's already kind of old news as I write, but it got me thinking about the high price we early adopters pay for the sake having new tech first.

I didn't get burned by this particular gadget, although I must admit that when I started reading the pre-launch hype online and seeing the TV ads , I felt the beginnings of that old, familiar feeling. You know the one; that soft, yet insistent call that only we can hear when there's shiny new technology afoot. And, in most cases, the first time we see one of our fellow tech rubes holding said gadget, that whispering beckon becomes a full-on roar, demanding that we drop whatever we're doing and run *(don't walk!)* to the nearest store or Internet-connected device and pay whatever price they're asking. But I held firm, because for one reason or another phones have never really triggered my geek reflex in quite the same way other gadgets do. Also, although I love my iPod nano, I've never really been an Apply guy. Nothing against 'em, they're just not my thing.

Lots of you probably did get iPhones at launch, though. Some of you may even have been in the lines outside participating retailers, waiting like middle-class, tech-starved refugees, hoping against hope that there would be sustenance for you before they closed the doors.

So how's that $100 store credit treating you?

Yeah, I know. It's not about the money. We pay what we must because we're twisted in some fundamental yet mostly hidden way, and no matter how crazy it seems, or how our significant others beg, threaten, or cajole, we quite simply can't help ourselves. That's why we keep coming back, time after time. *Thank you, sir! May I have another?!*

Many of you probably remember my fierce rant in this very spot in the June issue, decrying the practice certain videogame console makers have adopted of re-releasing souped-up versions of their machines well after the initial launch. Some of you may even have interpreted that as a declaration that I would never buy an Xbox 360 Elite, although many of you—those of you who favor the smell of new electronics to that of baking bread—probably knew better.

Anybody know if Microsoft's offering a $100 store credit?

**Chris Trumble, Publication Editor, *CPU***

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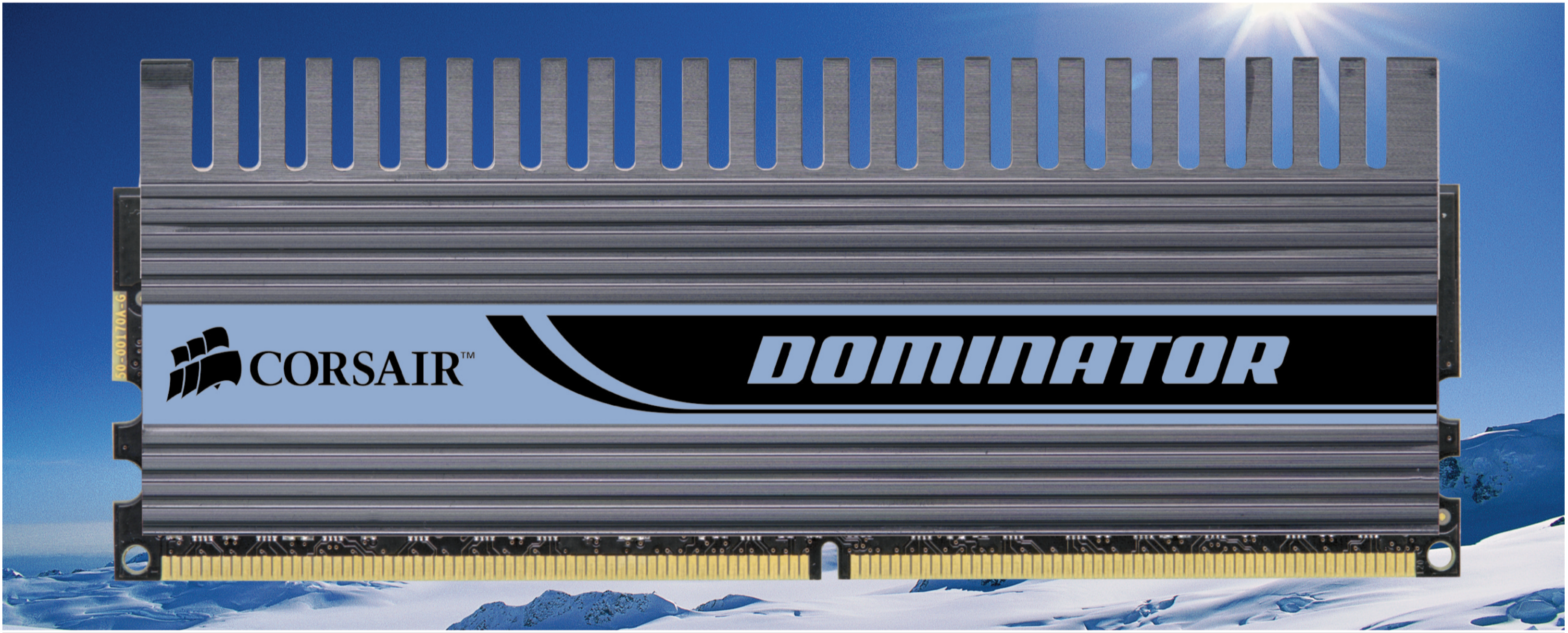
Gotcha.
Here it is.

# Cool Performance



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### Protect Components While You Push Performance

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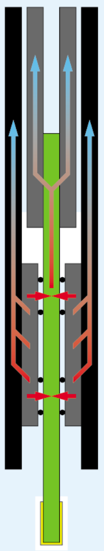
### Also Featuring Enhanced Performance Profiles (EPP)

As with all new Corsair performance memory, DOMINATOR modules feature EPP, the new open standard for the Serial Presence Detect (SPD) jointly developed by NVIDIA and Corsair. EPP simplifies overclocking for beginners and provides unparalleled control for experts.



AIRFLOW

***An optional Airflow fan (not shown) provides even more cooling and protection.***

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# What's Happening • Hardware

Compiled by Blaine Flamig

## New iPods Delight & Infuriate

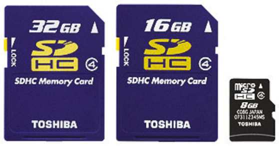
A funny thing happened during Steve Jobs' early-September announcement of new iPods, including the jazzier shuffle; big-bottomed, video-playing nano; Wi-Fi-friendly iTouch; and rechristened 160GB iPod Classic (40,000 songs, people). Jobs also simultaneously teed off scores of early iPhone adapters after announcing the just-months-old iPhone, which iSuppli reports outsold all other smartphones in July, will now be $200 cheaper. Jobs eventually placated those torked-off buyers with $100 store credit. Still, despite all the ensuing iPhone hacking and NBC taking "The Office" and its other digital downloads to Amazon.com's Unbox, news that Starbucks will give millions of hopped-up coffee drinkers free access to Apple's new Wi-Fi iTunes Store had to pep Jobs up. ▲

## "Don't Forget Us"

Even the most trivial of announcements from Apple temporarily blocks out the media sun, let alone news concerning new iPods, but there are other players not named Apple, and they've been busy lately, too. SanDisk recently released the impressively affordable 2GB ($40)/4GB ($60) Sansa Clip. Sony showed off new 2, 4, and 8GB NWZ-A810 and NWZ-S610 video-playing Walkmans for U.S. users, while Toshiba trotted out the new 4GB, Wi-Fi-packing Gigabeat T-Series T401 ($260). And not to be forgotten, Microsoft announced a $50 price drop for the Zune, while Mindy Mount, Microsoft entertainment and devices division CFO, was quoted that the idea of a Zune phone isn't "unreasonable." ▲

## Toshiba Notebook Drives Now Bench Press 320GB & More

If you're a big-time notebook user, you have to be big-time happy with news of Toshiba's new MK-52GSX 2.5-inch SATA notebook drive, which maxes out at a big-time and world-best 320GB. The two-plattered giant runs at 5,400rpm and sports an 8MB buffer and 12ms average seek time. Expect production to start yet this year. Elsewhere, Toshiba also recently took memory card storage to unprecedented heights with a new 32GB SDHC card. Although that capacity won't be ready until January, expect new 16GB SDHC and 8GB mini-SDHC cards in October. Finally, Japanese manufacturer DTS has released details of its mCell HyperDrive, which combines an 80/120/160GB 2.5-inch SATA drive with a real-time OS, CPU, and 1GB DDR RAM, all residing in a 3.5-inch case. Transfer rates reportedly hit 110MBps. Nice. ▲



## Gateway, Yes; Seagate, No

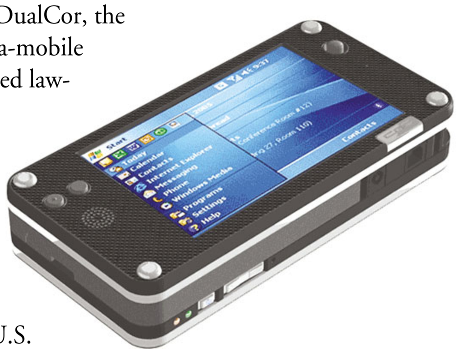
Gateway may have its price, as we learned in late August when Acer bought the cowhided company for a reported $700-plus million, but Seagate isn't on the selling block, says CEO Bill Watkins, despite rumored interest from Chinese, Korean, and Japanese companies in obtaining ownership of the U.S. hard drive maker. Although the buying and selling of tech companies has become somewhat back-page news in recent years, the interest by a Chinese company in buying Seagate got the attention of U.S. governmental officials with national security concerns, according to quotes from Hawkins. Despite the attention, Seagate managed to release new Maxtor OneTouch 4 drives in September, including a $359.99, 1TB Plus version. ▲

# Hardware Mole

## Some Firsts From Alienware & Its Kin

Alienware beat other system makers to the Blu-ray punch in late August when it announced itself as the first manufacturer to offer 4X drives in its desktops. Look for the $600 optional dual-layer BD/DVD±RW/CD-RW drive in the company's Area-51 7500, Aurora 7500, Area-51 ALX, and Aurora ALX lines. Meanwhile, NVousPC, the custom notebook company, began offering personalized options in August for its 14.1-inch Mercury (starting at $1,099.99) and 15.4-inch Ether (starting at $999.99) product lines. Beyond some fetching paint schemes, if you already own a notebook, NVousPC personalizes those, too. ▲

## What's In A Name?



Evidently a bit of money when you're referring to "Dual Core." The question arises after DualCor, the California maker of the cPC ultra-mobile handheld, filed a trademark-related lawsuit in early September against Intel concerning the use of "Dual Core." DualCor's lawsuit reportedly seeks damages and a permanent injunction against Intel relating to the alleged infringement of its DualCor trademark, which the U.S. Patent and Trademark Office apparently granted DualCor years ago. No word yet if DualCor has similar treatment in mind for AMD. Oh yeah, did we mention that DualCor offers an embedded Intel chip option with the cPC? ▲

## AMD's Sales Chief Takes His Leave

By all accounts, as head of sales and marketing, Henri Richard was as big of a cog in the AMD machine as nearly any executive in the company before he announced his resignation in August. The split appears to have been a friendly one on both sides, and Richard didn't stray far from home. Soon after resigning, he signed up as senior vice president and chief of sales and marketing at Freescale, based in—you guessed it—Austin. Still, Richard's resignation comes soon after Dave Orton's departure as AMD's graphics chief and the already-late Barcelona launch looming around the corner. ▲

Compiled by Dean Takahashi

## Ageia Launches PhysX Chip For Mobile Market

Ageia Technologies has announced it has taken its hardware-accelerated PhysX chip to the gaming laptop market with the world's first mobile physics chip. The PhysX 100M mobile processor is targeted at the highest-performance gaming notebook PCs. The company has already launched its desktop PhysX chip, but the mobile version will dissipate as little as 10 watts during gameplay conditions, the company says. The chip has active power management to throttle down the clock in high-heat system conditions and to effectively put the chip to sleep when it's not active. The company is trying to use the processing power of its chips to create more realistic gameplay, from visually arresting and physically accurate explosions to accurate handling of cars in racing games. ▲

## Tilera Puts 64 Cores On A Single Chip

Started by MIT computer scientist Anant Agrawal, Tilera is the latest startup to go after the networking chip market with a multicore architecture. The company is putting 64 cores on a single chip, with a chip interconnect bandwidth of 32 terabits per second. Each of the cores can run a different version of an operating system or band together to run a single OS. The Tile64 chip is designed with a lot of thoroughfares across the chip, much like the way a modern city is designed, Agrawal said. The chip has been sold to networking companies such as 3Com and video processing firms such as Codian. The chip will cost $435 in quantities of 10,000. Agrawal started the company in 2004, but he started the research for it as early as 1997. He said the performance is 10 times better than a dual-core Intel Xeon and 30 times the performance per watt. The clock speed starts at 600MHz. ▲

## Watching The Chips Fall

Here is pricing information for AMD and Intel CPUs.

*Retail price
** Manufacturer's price per 1,000 units
Other current prices, if indicated, are lowest OEM prices available through Pricegrabber.com

| CPU | Released | Original price | Last month's price | Current price |
|---|---|---|---|---|
| AMD Turion TL-56 1.8GHz 1MB cache 1,600MHz HyperTransport bus | 5/3/2007 | $184** | $180 | $180 |
| AMD Turion TL-60 2GHz 1MB cache 1,600MHz HyperTransport bus | 5/3/2007 | $220** | $251 | $220** |
| AMD Turion TL-64 2.2GHz 1MB cache 1,600MHz HyperTransport bus | 5/3/2007 | $354** | $251 | $247 |
| AMD Athlon 64 X2 Dual-Core 5600+ AM2 only | 12/12/2006 | $505** | $148 | $148 |
| AMD Athlon 64 X2 Dual-Core 6000+ AM2 only | 2/20/2007 | $464** | $169 | $162 |
| AMD Athlon 64 X2 Dual-Core 6400+ AM2 only | 8/20/2007 | $251** | $251** | N/A |
| AMD Athlon 64 FX-70 | 11/30/2006 | $599/pair | $323 | $317 |
| AMD Athlon 64 FX-72 | 11/30/2006 | $799/pair | $280 | $280 |
| AMD Athlon 64 FX-74 | 11/30/2006 | $999/pair | $299 | $319 |
| Intel Core 2 Duo Mobile T7100 1.8GHz 4MB cache 800MHz FSB | 5/9/2007 | $209** | $212 | $212 |
| Intel Core 2 Duo Mobile T7300 2GHz 4MB cache 800MHz FSB | 5/9/2007 | $241** | $249 | $249 |
| Intel Core 2 Duo Mobile T7500 2.2GHz 4MB cache 800MHz FSB | 5/9/2007 | $316** | $339 | $333 |
| Intel Core 2 Duo Mobile T7700 2.4GHz 4MB cache 800MHz FSB | 5/9/2007 | $530** | $538 | $538 |
| Intel Core 2 Extreme Mobile X7800 | 7/16/2007 | $851** | $851** | $851** |
| Intel Core 2 Duo E6540 | 7/16/2007 | $163** | $163** | $163** |
| Intel Core 2 Duo E6550 | 7/16/2007 | $163** | $174 | $163** |
| Intel Core 2 Duo E6600 2.4GHz 4MB cache 1,066MHz FSB 65nm | 7/27/2006 | $316** | $224 | $214 |
| Intel Core 2 Duo E6700 2.66GHz 4MB cache 1,066MHz FSB 65nm | 7/27/2006 | $530** | $313 | $313 |
| Intel Core 2 Duo E6750 | 7/16/2007 | $183** | $198 | $183** |
| Intel Core 2 Duo E6850 | 7/16/2007 | $266** | $279 | $266** |
| Intel Core 2 Duo X6800 2.93GHz 4MB cache 1,066MHz FSB 65nm | 7/27/2006 | $999** | $843 | $910 |
| Intel Core 2 Quad Q6600 | 1/8/2007 | $851** | $279 | $295 |
| Intel Core 2 Quad Q6700 | 7/16/2007 | $530** | $499 | $530** |
| Intel Core 2 Extreme QX6700 | 11/14/2006 | $999** | $1,068 | $949 |
| Intel Core 2 Extreme QX6800 | 7/16/2007 | $999** | $829 | $999** |
| Intel Core 2 Extreme QX6850 3GHz 8MB cache 1,333MHz FSB 65nm | 7/16/2007 | $999** | $1,119 | $999** |

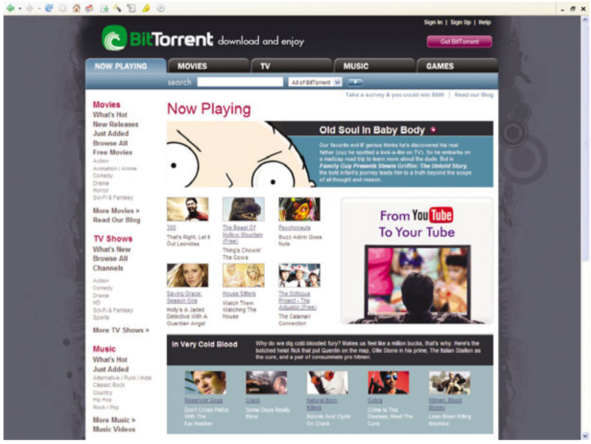
## Hewlett-Packard Nanotech Expert Predicts Hybrid of Silicon, Nanoswitches & Photonics

Stan Williams is a senior fellow and head of the Quantum Research Lab at HP. He thinks that the decades-long progress of silicon-based CMOS will come to a halt in coming years as the laws of physics get in the way of further miniaturization. But Williams said at the recent Hot Chips conference that hybrid devices will emerge that use silicon as the base and combine new photonics and nanoswitching technologies. The photonics technologies are advancing rapidly, and Williams predicts they will be useful in delivering extremely high bandwidth into the chip. The nanoswitches, meanwhile, will use molecular transistors to create much denser circuitry than would otherwise be possible. In the labs, Williams' team has already built devices with 17-nanometer circuits, and he expects to create circuits with half that width this year. ▲

Compiled by Blaine Flamig

## P2P Is Really Popular

How much so? According to preliminary results from its 2007 P2P Survey, German Internet traffic management and analysis company ipoque reports that P2P-related applications account for between 50 to 90% of all Internet traffic. Yikes. BitTorrent heads the P2P charge with 50 to 75% of all P2P activity, followed by eDonkey, which, depending on location, accounts for 5 to 50% of all P2P traffic. Beyond the P2P realm, ipoque reports Skype generates up to 2% of overall Internet traffic in certain networks despite its low-bandwidth characteristics. ipoque was expected to release full details of its survey in late September at Technology Review's Emerging Technology Conference at MIT. ▲



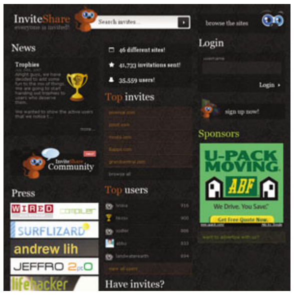
## Yes, There Are Resources Besides Google

Although the "Beyond Google: How Do Students Conduct Academic Research?" study Professor Alison Head led from January through May at St. Mary's College of California probably isn't representational of every campus' students, it offers some encouraging statistics. For example, rather than turn immediately to Wikipedia, Google, or another search engine when faced with a looming research paper, 40% of students surveyed indicate they consult their course readings first. Further, 23% say they initially turn to the library's Web site for database-archived material. The survey did show 13% of students go the Google and Wikipedia route first, and the study did only include input from less than 200 upper-division students. Still, it's heartening to know 12% of them rely on their professors as their first source for information. ▲

# Site Seeing

### Are You On The Guest List?

Add InviteShare to the list of why-didn't-we-think-of-that Web sites. The Web destination, which recently made founder Jeff Broderick $25,000 richer after TechCrunch bought it from him, serves as a hook-up spot for those who possess private beta invitations and those who want them. Using InviteShare is as easy as registering free, adding your name to a list, and awaiting an invitation. In true give-and-you-shall-receive nature, the more invitations you hand out, the more likely you are to receive them. At press time, InviteShare had more than 35,000 registered users; handed out over 41,000 invitations; and had betas available from 46 sites, including Joost, Pownce, and SuperTorrents. ▲

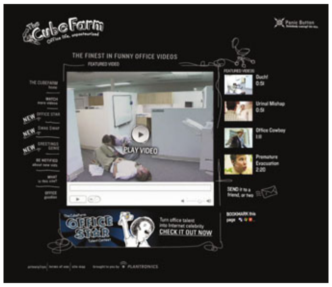


### Speaking Of Betas . . .

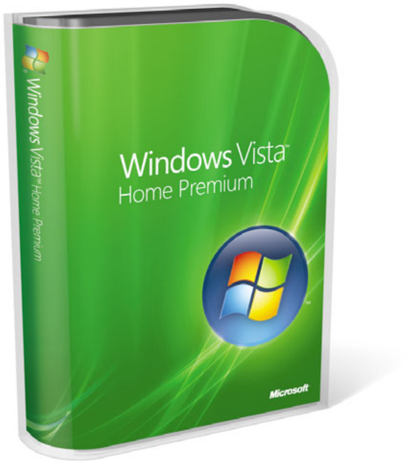
Although RemoTV is still pre-official, the free app looks promising in a mobile, Slingbox sort of way. Essentially, it helps you stream content from audio, video, and photo Channels that you manage on your PC to a Web-enabled cell phone or other mobile device. RemoTV also puts a P2P spin on things by optionally letting you share content with others and vice versa in an effort to provide "more content than any other cellular TV provider." RemoTV indicates plans to digitally fingerprint copyrighted material, and you can expect some ad content for the viewing privilege, with RemoTV reportedly sharing revenue with media producers. ▲

### Down On The (Cubicle) Farm

You have to love a site that builds a Panic Button into its home page. Press it and a phoney Word doc pops up with the hope your approaching boss will think you're doing something productive and not viewing the "corporate mockery" video clips available at The Cube Farm (Office Life, Unpasteurized). If you reside in a 6- x 6-footer, you'll undoubtedly find something in common with said videos. Whether reveling in the dizziness of The Office Spinner (nice chair velocity) or marveling at the amazing prowess of the water jug juggler, there's something here for every office drone to appreciate. Now get to work. ▲



Compiled by Blaine Flamig

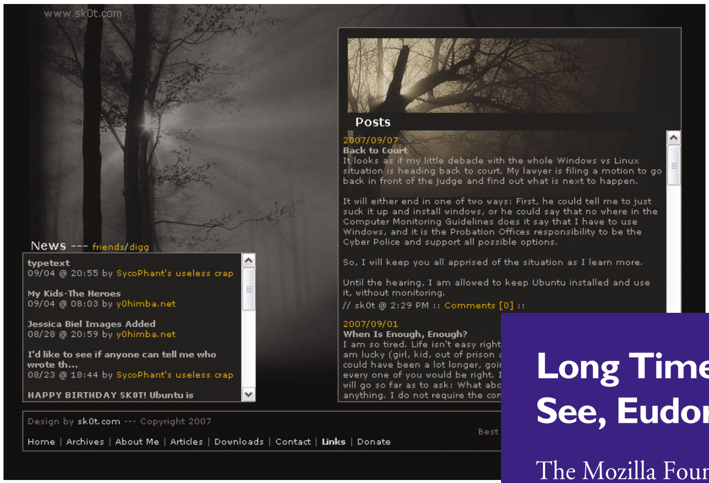


## Is Vista SP1 Coming? Yes & No

Consider steering clear of your resident system administrator sometime after the New Year. If plans to release Service Pack 1 for Vista in early Q1 2008 hold true, that's when Vista updating will begin en masse. For now, a beta version of Vista SP1 should now be available in small numbers. Vista team members announced beta details in late August on Microsoft's official Vista blog, citing that SP1 will contain "changes focused on addressing specific reliability and performance issues we've identified via customer feedback, supporting new types of hardware, and adding support for several emerging standards." ▲

## Cruel & Unusual Punishment?

After former ElitTorrents.com administrator Scott McCausland was caught uploading "Star Wars: Episode III" hours prior to the flick's release (it was reportedly downloaded 10,000-plus times in a day), he did a five-month federal prison stint and then started probation. Fair enough. Later, as part of probation, the feds wanted monitoring software installed on his system. Fair enough, still. But as McCausland now reports on his blog, the fed's monitoring application doesn't run on Linux, which McCausland uses. Further, the app lacks Vista support, so it's WinXP for McCausland. According to his blog, McCausland plans a legal retaliation to fight the mandatory OS switch. ▲



**typetext**
09/04 @ 20:55 by SycoPhant's useless crap

**My Kids-The Heroes**
09/04 @ 08:03 by y0himba.net

**Jessica Biel Images Added**
08/28 @ 20:59 by y0himba.net

**I'd like to see if anyone can tell me who wrote th...**
08/23 @ 18:44 by SycoPhant's useless crap

**HAPPY BIRTHDAY SK0T! Ubuntu is**

2007/09/07
**Back to Court**
It looks as if my little debacle with the whole Windows vs Linux situation is heading back to court. My lawyer is filing a motion to go back in front of the judge and find out what is next to happen.

It will either end in one of two ways: First, he could tell me to just suck it up and install windows, or he could say that no where in the Computer Monitoring Guidelines does it say that I have to use Windows, and it is the Probation Offices responsibility to be the Cyber Police and support all possible options.

So, I will keep you all apprised of the situation as I learn more.

Until the hearing, I am allowed to keep Ubuntu installed and use it, without monitoring.
// sk0t @ 2:29 PM :: Comments [0] ::

2007/09/01
**When Is Enough, Enough?**
I am so tired. Life isn't easy right
am lucky (girl, kid, out of prison
could have been a lot longer, goi
every one of you would be right. I
will go so far as to ask: What abo
anything. I do not require the con

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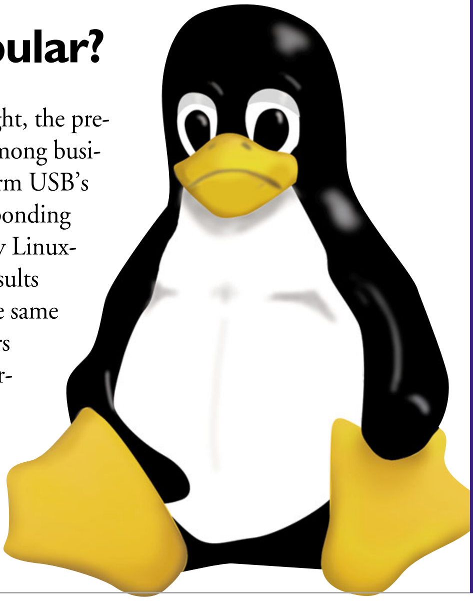
Best

## Linux Becomes Less Popular?

If results of a recent survey of 60 CIOs carry any weight, the previous favorable rate of adoption Linux had enjoyed among businesses will slow next year. According to investment firm USB's quarterly "CIO Pulse" survey, more than 90% of responding CIOs who don't use Linux indicate they won't deploy Linux-based servers this year. That's up 3% from January results and much higher than the 60% who responded to the same question in 2006. As expected, Windows-based servers lead the way (80% market share), according to the survey, with Unix-based machines holding a 13% share (down from 28% in January). In better Linux news (depending on how you look at it), W3 Counter reports Linux OSes now enjoy a 1.34% market share, the same as Windows 98. ▲



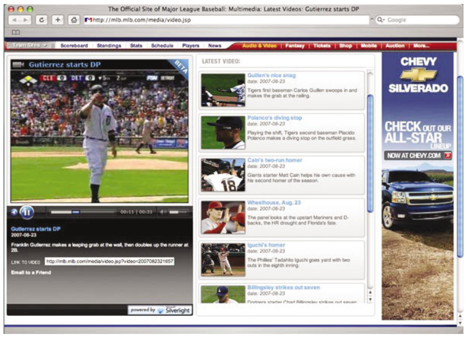
## Long Time No See, Eudora

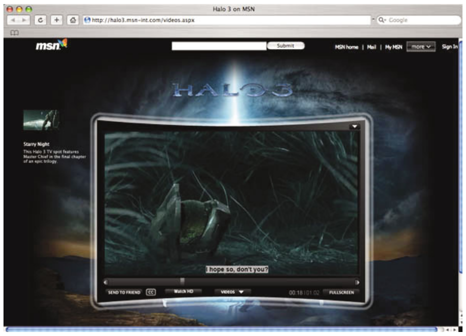
The Mozilla Foundation brought Eudora, the venerable email app that got its start in 1988, back from the Land of Beloved Software in early September with Windows and Mac beta releases. The open-sourcers picked up the Eudora ball and started running with it in October 2006 after Qualcomm decided it didn't want to play any longer. Commercial Eudora sales ceased in May. This beta release includes the Penelope extension for Thunderbird and Eudora. On the Mozilla Wiki site, developers stated, "It is our goal to build a single development community around Thunderbird and Eudora so that both mailers advance faster than before." ▲

# Software Shorts

## A Flash Of Silverlight

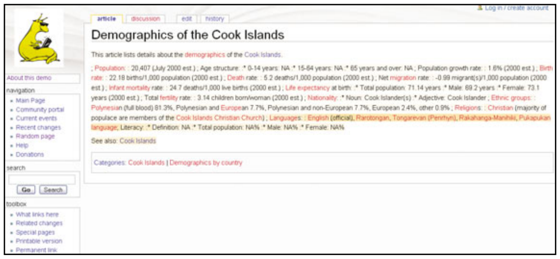
That flash of bright light coming from your LCD screen in early September was the official release of the cross-browser, cross-platform Silverlight, a Microsoft-produced answer to Adobe's Flash Player. In addition to hooking up with Novell to enable Linux distribution (known as Moonlight), Microsoft released Silverlight with Mac support. According to a blog entry from Scott Guthrie, general manager in Microsoft's Developer Division, developers are already at work on the Silverlight 1.1 release, which, among other things, will "include a cross-platform version of the .NET Framework and will enable a rich .NET development experience in the browser." ▲


The Official Site of Major League Baseball: Multimedia: Latest Videos: Gutierrez starts DP
Gutierrez starts DP
LATEST VIDEO:
CHEVY SILVERADO
CHECK OUT OUR ALL-STAR LINEUP
powered by Silverlight



## Software Shows Wikipedia's True Colors

We all know that due to the anyone-can-edit nature of Wikipedia, you can't believe everything you read there. Still, professors at the University of California, Santa Cruz, are working on "content-driven reputation" software that could clear things up a little. The application (available at trust.cse.ucsc.edu) that Luca de Alfaro and fellow developers constructed essentially mines Wikipedia pages looking for specific characteristics and, based on those, colors text "according to a value of trust, computed from the reputation of the authors who contributed the text, as well as those who edited the text." Text on white is trusted; text on orange is suspect. de Alfaro demoed the app recently at the Wikimania Convention in Taiwan, but there's no word if it will be permanently folded into Wikipedia. ▲



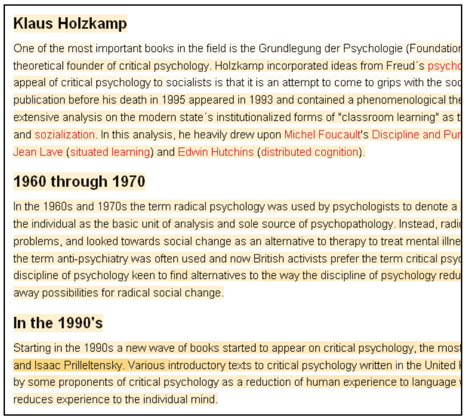
Demographics of the Cook Islands

This article lists details about the demographics of the Cook Islands.

; Population: : 20,407 (July 2000 est.) ; Age structure: :* 0-14 years: NA :* 15-64 years: NA :* 65 years and over: NA ; Population growth rate: : 1.6% (2000 est.) ; Birth rate: : 22.18 births/1,000 population (2000 est.) ; Death rate: : 5.2 deaths/1,000 population (2000 est.) ; Net migration rate: : -0.99 migrant(s)/1,000 population (2000 est.) ; Infant mortality rate: : 24.7 deaths/1,000 live births (2000 est.) ; Life expectancy at birth: :* Total population: 71.14 years :* Male: 69.2 years :* Female: 73.1 years (2000 est.) ; Total fertility rate: : 3.14 children born/woman (2000 est.) ; Nationality: :* Noun: Cook Islander(s) :* Adjective: Cook Islander ; Ethnic groups: : Polynesian (full blood) 81.3%, Polynesian and European 7.7%, Polynesian and non-European 7.7%, European 2.4%, other 0.9% ; Religions: : Christian (majority of populace are members of the Cook Islands Christian Church) ; Languages: : English (official), Rarotongan, Tongarevan (Penrhyn), Rakahanga-Manihiki, Pukapukan language; Literacy: :* Definition: NA :* Total population: NA% :* Male: NA% :* Female: NA%

See also: Cook Islands

Categories: Cook Islands | Demographics by country



**Klaus Holzkamp**

One of the most important books in the field is the Grundlegung der Psychologie (Foundatior
theoretical founder of critical psychology. Holzkamp incorporated ideas from Freud´s psycho
appeal of critical psychology to socialists is that it is an attempt to come to grips with the soc
publication before his death in 1995 appeared in 1993 and contained a phenomenological the
extensive analysis on the modern state´s institutionalized forms of "classroom learning" as t
and sozialization. In this analysis, he heavily drew upon Michel Foucault's Discipline and Pur
Jean Lave (situated learning) and Edwin Hutchins (distributed cognition).

**1960 through 1970**

In the 1960s and 1970s the term radical psychology was used by psychologists to denote a
the individual as the basic unit of analysis and sole source of psychopathology. Instead, radic
problems, and looked towards social change as an alternative to therapy to treat mental illne
the term anti-psychiatry was often used and now British activists prefer the term critical psyc
discipline of psychology keen to find alternatives to the way the discipline of psychology redu
away possibilities for radical social change.

**In the 1990's**

Starting in the 1990s a new wave of books started to appear on critical psychology, the most
and Isaac Prilleltensky. Various introductory texts to critical psychology written in the United
by some proponents of critical psychology as a reduction of human experience to language
reduces experience to the individual mind.

## BIOS Upgrades Available Online

Compiled by Steve Smith

Before you send another motherboard to the landfill, consider upgrading the BIOS and giving your PC a new lease on life. Here are a few recently released upgrades. Readers can check out www.cpumag.com/cpunov07/bios to see our entire upgrade list.

| Motherboard | Date Available | URL |
|---|---|---|
| ASRock ALiveNF5-VSTA 1.70 | 8/20/2007 | ftp://download.asrock.com/bios/AM2/ALiveNF5-VSTA(1.70).zip |
| Asus Blitz Extreme 0804 | 8/14/2007 | dlsvr01.asus.com/pub/ASUS/mb/socket775/Blitz_Extreme/BE0804.zip |
| Asus Striker Extreme 1303 | 7/26/2007 | dlsvr01.asus.com/pub/ASUS/mb/socket775/Stricker%20Extreme/SE1303.zip |
| ECS P4800-M7 061226 | 7/30/2007 | www.ecs.com.tw/ECSWebSite/Downloads/DownloadFile.aspx?catid=1&driverid=2912&areaid=2&LanID=9 |
| Gigabyte GA-M57SLI-S4 (Rev. 2) F11B | 8/9/2007 | america.giga-byte.com/FileList/BIOS/motherboard_bios_ga-m57sli-s4_f11b.exe |
| Intel D975XBX2 2777 | 8/6/2007 | downloadcenter.intel.com/download.aspx?url=/13825/eng/BX97520J.86A.2777.BI.ZIP&agr=N&ProductID=2578&DwnldId=13825&strOSs=38&OSFullName=OS%20Independent&lang=eng |
| MSI K9N Diamond 1.6 | 7/12/2007 | global.msi.com.tw/index.php?func=downloadfile&dno=5708&type=bios |

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- HyperTransport Technology
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Wireless 802.11g 54MBps Mini-PCI Network
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High Performance Li-Ion Battery; Free Deluxe Carrying Case

| AMD® Turion™ 64 MobileTechnology | |
|---|---|
| TL-56 Processor | $1129 |
| TL-64 Processor | $1249 |
| TL-66 Processor | $1339 |

**$1129**

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Built-in 1.3 Mega Pixels CMOS Camera
4x USB 2.0 & 1X Firewire IEEE-1394 Ports
Free Deluxe Carrying Case

| AMD Turion™ 64 MobileTechnology | |
|---|---|
| TL-56 Processor | $1399 |
| TL-64 Processor | $1519 |
| TL-66 Processor | $1619 |

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ViewSonic 19" Q19WB Widescreen LCD Monitor

| AMD Athlon™ 64 X2 dual-core Processor | |
|---|---|
| 6400+ (Socket AM2) | $1149 |
| 6000+ (Socket AM2) | $1039 |
| 5600+ (Socket AM2) | $999 |
| 5000+ (Socket AM2) | $989 |

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## Gamer Mage 760-SLI™

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Logitech Deluxe Keyboard & Optical Mouse
Free Wireless 802.11g 54MBps Network Adapter

| AMD Athlon™ 64 X2 dual-core Processor | |
|---|---|
| 6400+ (Socket AM2) | $1289 |
| 6000+ (Socket AM2) | $1209 |
| 5600+ (Socket AM2) | $1179 |
| 5200+ (Socket AM2) | $1159 |
| 4800+ (Socket AM2) | $1139 |
| 4400+ (Socket AM2) | $1119 |
| 4000+ (Socket AM2) | $1089 |

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Add ViewSonic® 20" VG2030wm Wide-Screen LCD @259

| AMD Athlon™ 64 X2 dual-core Processor | |
|---|---|
| 6400+ (Socket AM2) | $719 |
| 6000+ (Socket AM2) | $639 |
| 5600+ (Socket AM2) | $619 |
| 5200+ (Socket AM2) | $599 |
| 4800+ (Socket AM2) | $579 |
| 4400+ (Socket AM2) | $549 |
| 4000+ (Socket AM2) | $529 |

**$529**

## Gamer Mage 400-Ultra

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18x Double Layer DVD±R/±RW Drive
8 Channel Surround 3D Premium Sound
600Watt Surround Sound Speakers
10/100/1000 MBps Ethernet LAN
Logitech Deluxe Keyboard & Optical Mouse

| AMD Athlon™ 64 X2 dual-core Processor | |
|---|---|
| 6400+ (Socket AM2) | $1019 |
| 6000+ (Socket AM2) | $909 |
| 5600+ (Socket AM2) | $889 |
| 5200+ (Socket AM2) | $869 |
| 4800+ (Socket AM2) | $839 |
| 4400+ (Socket AM2) | $819 |
| 4000+ (Socket AM2) | $789 |

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10/100/1000 MBps Ethernet LAN
Logitech Deluxe Keyboard; Optical Mouse
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| AMD Athlon™ 64 X2 dual-core Processor | |
|---|---|
| 6400+ (Socket AM2) | $1739 |
| 6000+ (Socket AM2) | $1649 |
| 5600+ (Socket AM2) | $1629 |
| 5200+ (Socket AM2) | $1609 |
| 4800+ (Socket AM2) | $1589 |
| 4400+ (Socket AM2) | $1569 |
| 4000+ (Socket AM2) | $1549 |

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IBUYPOWER

# DIGITAL ECONOMY

Compiled by Steve Smith

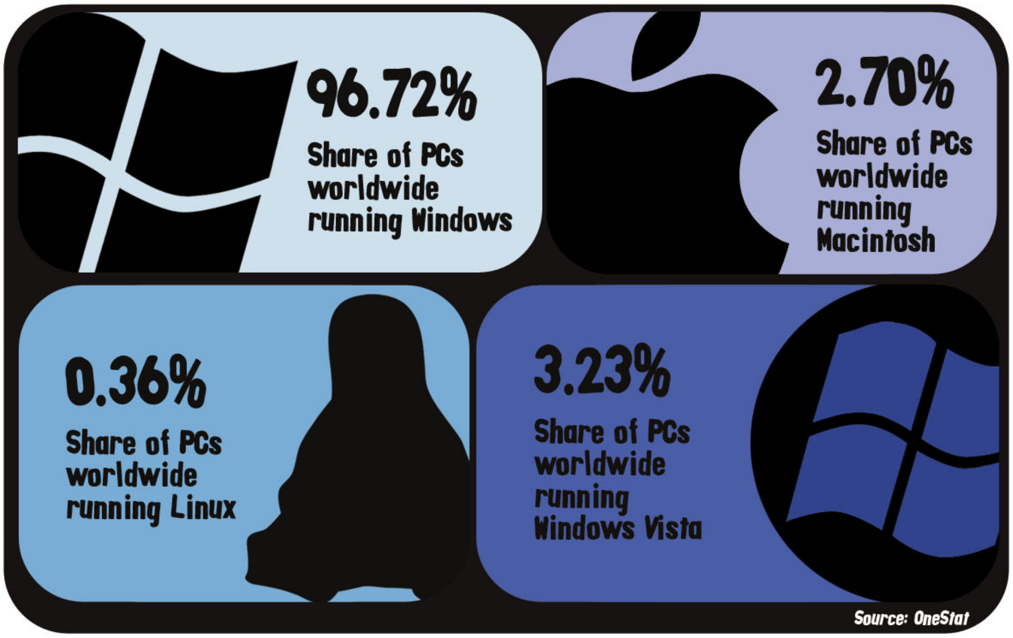
## The Job Search

Don't just watch video online; help develop the next generation of video applications that drive it. DivX, the video codec behind much of our online multimedia, is looking for the geekiest of the geeks. The company wants a senior software engineer for digital video technology, the kind of person who "write[s] an AVI parser because you wanted to know the details of the files you were downloading." If you're inquisitive and write rock-solid code, DivX may have a spot for you in its unconventional work space. This post is in the "Strategy & Technology" unit of the company that develops next-gen video apps for all of the OSes and devices on which DivX works. The unit is affectionately known in the company as "Monkey."

You will need to be fluent in C and C++ and "love to dabble with video." You will be writing the code that makes DivX multimedia run seamlessly across devices and platforms. Think home media servers, mobile phones, handheld multimedia gadgets, and the back-end video delivery systems that distribute all this eye candy.

If you pass muster, the best part of this gig may be just working at this place. It sounds as if you will be out of Dilbert-land and into the free-flowing world of DivX where, the company says, "No one has an office here, not even the CEO. . . . Our 'business casual' means flip-flops and jeans." Sounds like a high-tolerance place. DivX even rents movie theaters for its staff to screen new flicks, and Friday afternoons are spent "fragging" one another in office video game matches.

And that next version of the codec is coming when?



Source: OneStat

## Hardly Learning?

If you think you got your kid that pricey new laptop for college so he could study, think again. According to Youth Trends, U.S. female and male college students spend 12.4 to 12.1 hours a week, respectively, online for entertainment purposes and only 7.3 hours (females) and 6.6 hours (males) a week online for academic purposes. Perhaps colleges should just upload the lectures to YouTube.

*Source: www.emarketer.com*

## We're Engaged

Nielsen//NetRatings changed its metrics for measuring Web site performance in July, moving from counting "page views" to timing the length of time users spent on the site. Instant messaging and Web email drove overall usage at the major portals, but game playing at sites such as Pogo.com gave Electronic Arts its 3.5 billion minutes.

### Top 10 Web Brands In Total Minutes (May 2007)

| Brand | Total Mins. (bil) | Unique Visitors (mil) |
|---|---|---|
| AOL Media Network | 25 | 91.6 |
| Yahoo! | 19.6 | 107.6 |
| MSN/Windows Live | 10.6 | 95.9 |
| Fox Interactive Media | 7.8 | 64.1 |
| Google | 7.4 | 110.2 |
| eBay | 6.1 | 60.2 |
| Microsoft | 3.7 | 94.4 |
| Electronic Arts | 3.5 | 8.7 |
| Apple | 2.8 | 45 |
| YouTube | 2.1 | 48.2 |

*Source: Nielsen//NetRatings*

## The Saint

by Alex St. John

# Asia

A few years ago I visited China looking for talented game developers to create original games for online distribution. With the exception of an Ubisoft office in Shanghai that had made a substantial investment over the years to create a first-class operation, there were very few people in China with the experience to create commercial-grade games. I managed to find a couple qualified shops founded by ex-Ubisoft developers and produced a couple successful games in Shanghai, but overall I was disappointed by the general level of skills available in that market.

This year, I attended China's first Game Developers Conference in Shanghai. It was immediately clear that the market has advanced dramatically in the intervening years. There are several local online game publishers with multimillion-dollar businesses serving millions of paying Chinese gamers. Several Chinese MMOG hosting companies that began by licensing Korean MMOGs have learned to create original MMOGs locally and are operating successful homegrown gaming services. I visited several game developers and found modern operations producing quality game content. Overall, my assessment was that China is about where the U.S. game market was in production quality around 1997. 2D graphics are still ubiquitous, but there are some 3D games in development, often using licenses of the Unreal 2003 game engine to create Chinese-themed variations on World Of Warcraft.

Visiting China was an interesting contrast from other Asian countries I'm familiar with. Singapore is a very modern, clean city with a remarkably efficient albeit rigid government infrastructure. Thanks to its sea of western shopping malls, Starbucks stores, and Pizza Hut franchises, you would be hard-pressed not to mistake it for downtown Santa Monica if it weren't for the clean streets, English-speaking cab drivers, and conspicuous absence of vagrants. China, on the other hand, can be a highly deceptive experience. It's very easy on arrival in Shanghai to think that you've landed in an ultra-modern futuristic movie set populated with towering, exotic, neon-illuminated and video-surfaced skyscrapers. It's a thrilling exper-ience zipping from the airport to downtown Shanghai in eight minutes on the 285mph maglev bullet train. One can almost manage to ignore the discreetly veneered slums peeking out from behind miles of hastily erected fencing emblazoned with Beijing 2007 Olympics logos.

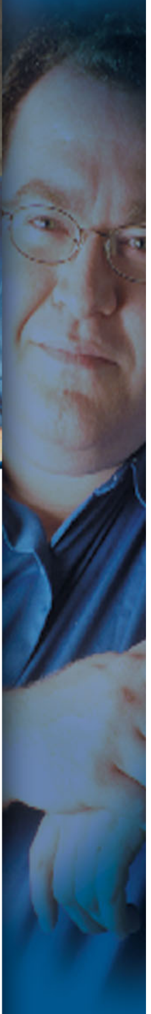
Two days earlier, on the way to visit the Beijing Pearl Market, I spotted an amazing structure sprouting from the Beijing skyline. I asked what it was. "It's Angkor Wat, they moved it here from Cambodia," replied my host without hesitation. I found myself sputtering, "Really?" before I could stop myself. He laughed and replied, "I have no idea, it wasn't there last week."

The Beijing Pearl Market is every gadget geek and teenage girl's dream. It's like a Turkish market for cloned gadgets and fake brand-name apparel. I was offered an Apple iPhone for a fraction of the cost of one in the U.S.; at a glance, it was identical to a genuine iPhone, but upon careful examination, I discovered that there were a few rather glaring differences in the UI. "Chinese version!" the vendor proudly explained.

I bought a pair of MP3-playing sunglasses for 20 bucks that would have run several hundred dollars in the U.S. Another vendor offered me a 32GB Sony flash memory thumb drive. After I scowled skeptically, he pulled a laptop out from under the counter and carefully walked me through a demonstration of Windows recognizing the device and reporting the claimed free memory. Apparently I wasn't the only doubtful customer. Naturally I bought one—just to confirm the vendor's veracity, of course—and it checked out, as well. Several teens charged past me wearing "authentic" Chinese fighter pilot helmets. The plethora of cell phones, cameras, faux-Rolex watches, and cool gadgets was amazing; I could have shopped all day. Being a giant bearded American didn't deter any of the shop keepers from trying to sell me "genuine" Coach purses, Puma sneakers, fur coats, and Prada cell phones. The vendors on the pearl floor were especially inquisitive about my relationship status: "You have girl friend? You have wife?" followed by the all-important question, "She like pearl?" ▲

Send your feedback to thesaint@cpumag.com.

*Alex St. John was one of the founding creators of Microsoft's DirectX technology. He is the subject of the book "Renegades Of The Empire" about the creation of DirectX and Chromeffects, an early effort by Microsoft to create a multimedia browser. Today Alex is President and CEO of WildTangent Inc., a technology company devoted to delivering CD-ROM quality entertainment content over the Web.*



> Overall, my assessment was that China is about where the U.S. game market was in production quality around 1997.

# DREAM HARDWARE

## These Gizmos Don't Sing It, They Bring It

So what are the voices telling you today, hmm? Does the message sound like it's coming from 11.2 places around the room? Print it on a giant banner. Drag it behind your blimp. The public must know, even if it doesn't appreciate you yet.

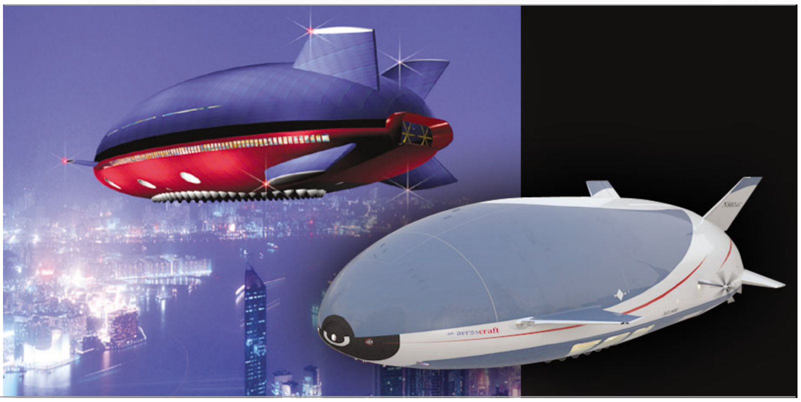
---

**by Marty Sems**

### Yamaha RX-Z11

Oh, I can't even say it. Eleven is a number that sorely needs a new joke. Let's just say that if 7.1-channel surround sound isn't enough for you, where can you go from there? Where? 11.2-channel. With this receiver ($5,499.95; www.yamaha.com), Yamaha takes your 7.1-channel input and fills in those four irritating sound gaps that have plagued you all these years. And they've addressed a heretofore unnoticed subwoofer deficiency with a second ultra-low channel. The RX-Z11's grocery list includes Dolby True HD, DTS HD Master Audio, XM HD Surround Sound, HDMI 1.3 supporting Deep Color (30/36-bit) and 120Hz and 24Hz refresh rates, auto calibration, and Windows Media Connect-enabled LAN video streaming. But wait—what about sounds that should occur above or below you? Erm . . . back to the drawing board.

### Aeros Aeroscraft ML866



Let's put it this way: You'll certainly make an impression. It's not exactly Air Force One, but with an Aeroscraft ML866 "sky yacht" (www.aerosml.com), you'll have a fully connected wireless office in the sky. Picture yourself commanding a high-definition videoconference from your personal dirigible. You'll be tooling along at 138mph over the limos of lesser individuals. Imagine the command and control you'll have over your empire from your bleeding-edge computerized office. And then laugh all the way over the bank as you think about the hangar fees your deflatable sky yacht is saving you.

### NUR Macroprinters Expedio Revolution

Super fast. Super wide. Superprinter! Sure, there are legitimate uses for an inkjet capable of printing billboards, but as you know, here at *CPU* we're always more stoked about the illegitimate misuses. You could wallpaper your room to look like a white-sand beach. Your backyard privacy fence could bear a panoramic screenshot of your greatest WoW triumph. And your roof could await the next imaging satellite flyover with a special home sales pitch for Zillow.com users. NUR's new Expedio Revolution (www.nur.com) is a 360dpi, CMYK inkjet that can print 16.6-foot wide images at up to 3,200 square feet an hour (an Expedio 5000 is shown). Its wide color gamut, UV-curable ink can last for two years in the sun and the rain, and that's if you don't bother to coat it after printing. *Viva la revolución.* ▲

# EP-2KW EP-2000P10-T3

*High efficiency*

***Think out side the box, E Power present the King, 2KW, power supply that is ready for anything.***

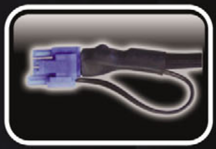
**RoHS**
2002/95/EC

Designed for RoHS standard to make a greener and cleaner world.

20+4 sliding ATX 12V connector to work on Intel AMD boards. EPS 12V support.
**US patent no.:US6,935,902 B1**

Active PFC

Active PFC- 0.99 power correction factor to save energy.



6+2 Pin PCI express lead with Patented EMI filter eliminate ripple noise and provide stable current

Patent No. 20200401992.0

- ★ Support Quard SLI, seven+12V rail support highend graphic card power demand
- ★ Support Quad Core CPU

ePOWER TECHNOLOGY
www.epowertec.com

# Dream PCs

## Bring On The Luxury

They're the fastest of the fast and they have paint jobs that will make your eyes water. They have roomy interiors, customizations galore, and price tags that separate the serious enthusiasts from the dreamers. We're talking, of course, about Dream PCs.

Price-performance comparisons hardly seem fair when dealing with luxury systems that boast so many add-ons, so we tossed price from consideration and judged these rigs by three elements: performance, luxury, and craftsmanship. High benchmark scores are standard on these systems, so if a system has the aesthetics and luxury items that make our jaws drop, it doesn't need the very highest benchmark scores to earn top marks from us.

In this roundup, the builders relied on many of the same components. The 3GHz Intel Core 2 Extreme QX6850, for example, is clearly the processor of choice. Most companies also relied on Nvidia GeForce 8800 Ultra video cards, though the 1GB version of AMD's ATI Radeon HD 2900XT also got a chance to play in three machines. Western Digital's 150GB Raptors saw plenty of action, as did Hitachi's new 1TB behemoth.

Despite this component homogeneity, our contestants produced wildly different beasts that put their talents, creativity, and overclocking skills in the spotlight. Kick back and enjoy the show.

---

## CyberPower Gamer Infinity SLI Extreme

**Gamer Infinity SLI Extreme**
$4,599
CyberPower
www.cyberpowerpc.com
CPUs: ● ● ● ◖

**Specs:** Intel Core 2 Extreme QX6850 @ 3.66GHz; Evga 122-CK-NF68-B1; 4GB Mushkin XP2-8500; Evga GeForce 8800 Ultra (SLI); 150GB Western Digital Raptor WD1500ADFD (2x; RAID 0); 500GB Deskstar T7K500 (2x); 1kW Thermaltake Toughpower; Sony DW-D26A DVD±RW; Lite-On LH-2B1S; Linksys WMP54GS; Razer Diamondback; Saitek Eclipse II; Windows Vista Home Premium 64-bit

Who says air cooling is dead? CyberPower broke from the pack with a liquid-free cooling setup. The PC boasts no fewer than seven 120mm fans, four of which sit on the side panel. Both of the Evga GeForce 8800 Ultras rely on air cooling, and the overclocked Intel Core 2 Extreme QX6850 churns along at 3.66GHz under a Peltier-based Vigor Monsoon II heatsink and fan.

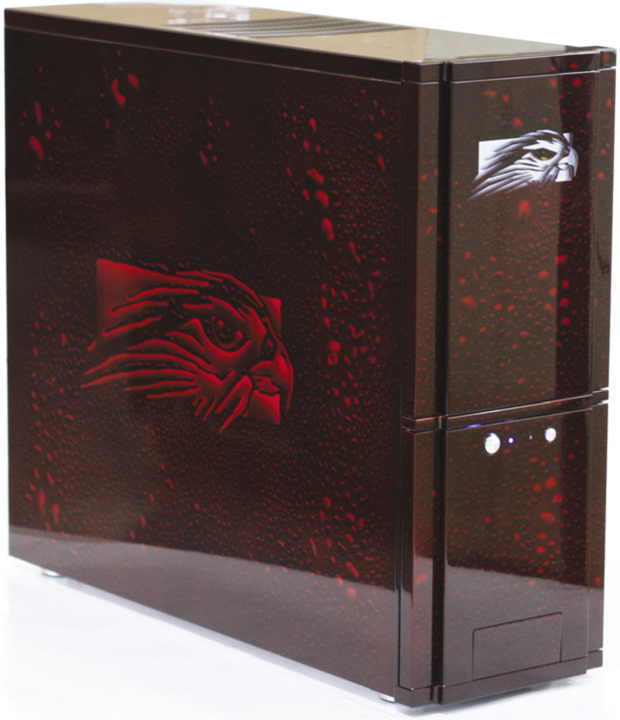
The Gamer Infinity SLI Extreme offers plenty of hard drive space, thanks to two 150GB Western Digital Raptor WD1500ADFD drives in RAID 0 (which handle the OS) and two 500GB Deskstar T7K500 drives.

CyberPower stocked our review unit with a Linksys WMP54GS—a nice touch. Gigabit LAN ports are standard fare on luxury PCs these days, but some of us have to endure the world of finicky APs and wireless interference.

The case's exterior features a green paint job and a vinyl wrap that depicts an Nvidia model. The vinyl fits the case perfectly and it's easily mistaken for a high-end paint job, but it's not foolproof. We noticed that the edges of the casing started to come loose within a couple days.

The Gamer Infinity SLI Extreme provided some solid benchmark scores. Its 11734 PCMark05 score was one of the highest in the bunch, and the 18219 3DMark06 score is nothing to sniff at, either. The system also fared well in the game benchmarks, posting 93fps in Oblivion and 70fps in S.T.A.L.K.E.R. The Gamer Infinity SLI Extreme is a solid choice for gamers.

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ● ● ◖ 2.5 = ABSOLUTELY AVERAGE | ● ● ● ● ● 5 = ABSOLUTELY PERFECT**



# Falcon Northwest Mach V

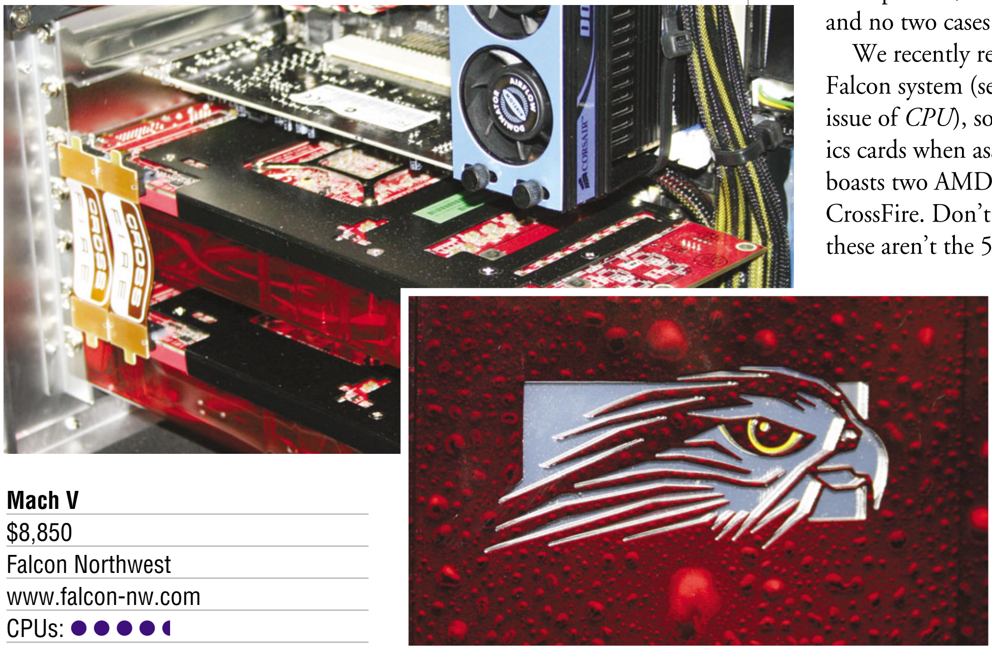
When it comes to PC paint jobs, Falcon Northwest is one of the best and most experienced in the industry. We've seen some great Falcon Exotix artwork on Mach V cases over the past few years (including a spine-tingling Half-Life 2-themed system), but the new Rain paint job takes the cake. The hand-painted case features rain droplets that look so real, we're tempted to reach for a towel whenever we see it.

The Mach V's Exotix: Red Rain paint job will set you back no less than $94 but includes the mouse and keyboard, as well as the PC. "The rain effect is a trade secret," says Kelt Reeves, CEO of Falcon Northwest. "But suffice to say that each drop is hand painted, and no two cases are ever alike."

We recently reviewed a red-hot Nvidia-based Falcon system (see page 29 in the September 2007 issue of *CPU*), so the builder opted for ATI graphics cards when assembling this rig. The Mach V boasts two AMD ATI Radeon HD 2900XTs in CrossFire. Don't let the 2900XT model fool you; these aren't the 512MB versions. Each card has 1GB of DDR4 memory.

The cards rely on their own fans, but Falcon cools the overclocked Intel Core 2 Extreme QX6850 to 3.71GHz with a Sanyo-Denke liquid cooler. The system also features Asus' brand-new Blitz Extreme motherboard and 2GB of DDR3 memory.

The Mach V slaughtered our benchmarks, posting 19017 in 3DMark06 and snagging the highest PCMark05 score in this roundup at 12577. Despite spinning at 7,200rpm, the striped array of dual, 1TB Hitachi Deskstar 7K1000 hard drives powered its way to a score of 9425 in PCMark05's hard drive test. With its solid performance and classy looks, the Mach V is a true luxury system.



**Mach V**
$8,850
Falcon Northwest
www.falcon-nw.com
CPUs: ●●●●◖

**Specs:** Intel Core 2 Extreme QX6850 @ 3.71GHz; Asus Blitz Extreme; 2GB Corsair Twin3X2048-1800C7DFG; 1GB AMD ATI Radeon HD 2900XT (CrossFire); 1TB Hitachi Deskstar 7K1000 (2x; RAID 0); Creative Labs Sound Blaster X-Fi XtremeGamer; 1kW Silverstone modular PSU; Lite-On LH-20A1H; Logitech G7; Microsoft Natural Ergonomic Keyboard 4000; Windows Vista Ultimate 32-bit

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT**

# Hypersonic Sonic Boom OCX

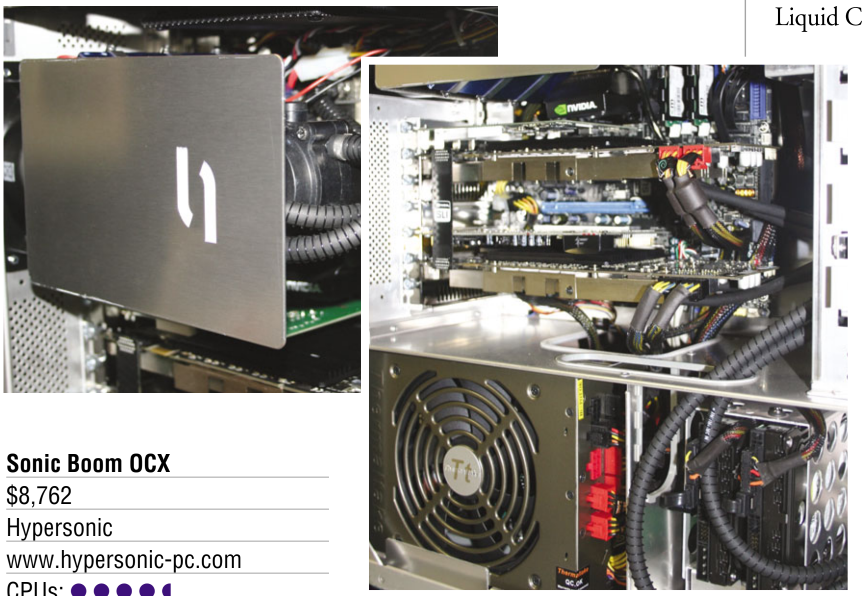
Raindrops, flames, and demons make for great PC paint schemes, but Hypersonic's Sonic Boom OCX proves that you don't need fancy images to create a slick paint job. The system's Reflexxion Series Chiaretto Red Pearl paint (applied by partner Colorware) has a mirror-like finish that caught the attention of several *CPU* staffers passing by the testing lab. If you have an extra $650 in your budget, we heartily recommend that you put it into the paint.

Hypersonic takes the system's insides as seriously as it takes the exterior. We found two Evga GeForce 8800 Ultra Superclocked graphics cards in SLI, as well as four hard drives: two 150GB Western Digital Raptor WD1500ADFDs and two 1TB Hitachi Deskstar 7K1000s. Both sets are in striped arrays, making for a spacious and speedy storage setup.

The Custom Dual GPU Liquid Cooling System by CoolIT handles both video cards, and the Custom Eliminator CPU Liquid Cooling System by CoolIT cools the processor, keeping noise to a minimum. A radiator sits at the bottom front of the system so that the 120mm fan pulls cool air into the system and through the radiator. Thanks to the cooling equipment, this is one of the most crowded cases we've seen, which means you'll probably have more trouble swapping out components when you upgrade.

The Sonic Boom OCX doesn't take the performance crown, but it's certainly a solid gaming system. The PC scored a very respectable 17932 in 3DMark06 and an even more impressive 11596 in PCMark05. Our game benchmarks also felt the impact of the Sonic Boom: The system posted 95fps in Oblivion and 70fps in S.T.A.L.K.E.R.

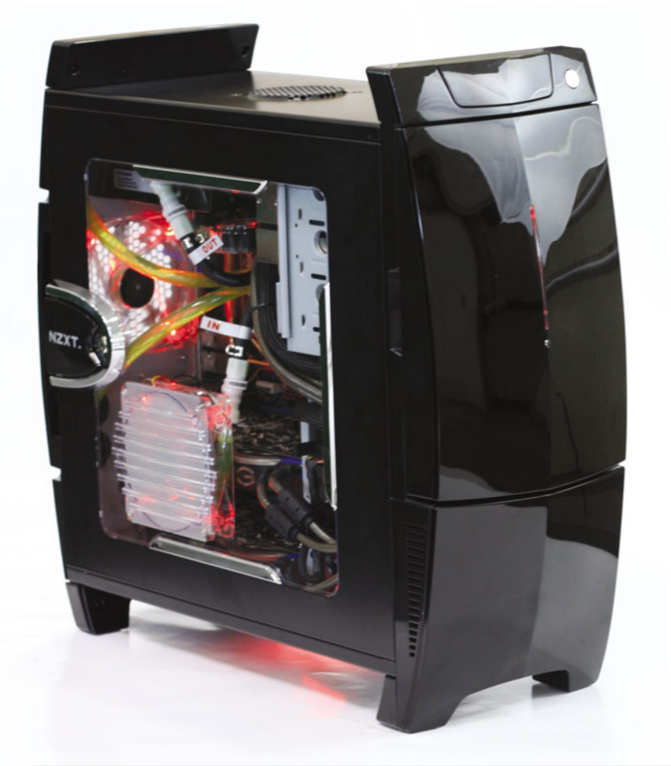
Although gaming performance is critical in a luxury PC, we're glad to see that Hypersonic added a few non-gaming features. The Sonic Boom's Hauppauge WinTV-HVR-1800 dual analog/digital TV tuner and Microsoft Windows MCE Remote Control are included for those times when you'd rather watch than play.



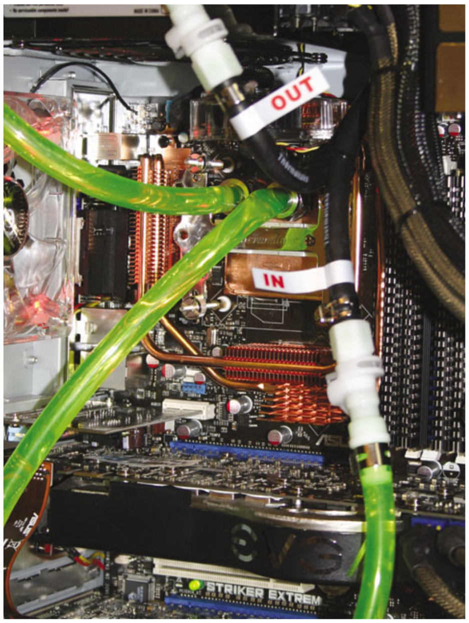
**Sonic Boom OCX**
$8,762
Hypersonic
www.hypersonic-pc.com
CPUs: ●●●●◖

**Specs:** Intel Core 2 Extreme QX6850 @ 3.61GHz; Evga 122-CK-NF68-A1; 2GB Mushkin XP2-8500; Evga GeForce 8800 Ultra Superclocked (SLI); 150GB Western Digital Raptor WD1500ADFD (2x; RAID 0); 1TB Hitachi Deskstar 7K1000 (2x: RAID 0); Creative Labs Sound Blaster X-Fi XtremeGamer Fatal1ty FPS; 1,200W Thermaltake Toughpower W0133RU; LG GGW-H10N; Plextor PX-810SA; Logitech G5; Logitech G15; Windows Vista Ultimate 32-bit

**CPU RANKING** ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**



# iBuypower Gamer Paladin 884-UM



**Gamer Paladin 884-UM**
$5,999
iBuypower
www.ibuypower.com
CPUs: ●●●

Specs: Intel Core 2 Extreme QX6850; Asus Striker Extreme; 4GB Corsair CM2X1024-10000C5D; Evga GeForce 8800 Ultra (SLI); 150GB Western Digital Raptor WD1500ADFD; 500GB Western Digital Caviar SE16 WD5000AAKS; Integrated audio; NZXT Precise Power 1,200W; Panasonic SW-5582 Blu-ray drive; Logitech G5; Logitech G15; Windows Vista Ultimate 64-bit

iBuypower's Gamer Paladin 884-UM is nothing if not flashy. The NZXT Lexa Blackline case has a glossy black finish and a side-panel window that lets fellow LAN partygoers get a view of the interior's lights and watercooling equipment. The other side panel sports a vinyl wrap that features a particularly mean-looking, battle-axe-wielding warrior.

However, the lights and gloss can't cover up two of the system's flaws. One of the case's plastic back feet has a loose plate that flaps when we lift or move the PC. That's a minor gripe, but the kink in one of the watercooling tubes presents a more serious problem. iBuypower tells us that it used long tubes to prevent kinking, but the tube leading to the CPU water block is badly bent. We weren't able alleviate the kink by moving the tube. We suspect that the builder could have averted this flow-reducing problem by using thicker tubing.

Warranty-covered overclocking is standard on today's top-shelf PCs, so we're surprised to see that the Gamer Paladin's watercooled Intel Core 2 Extreme QX-6850 runs at stock speed. iBuypower tells us that its customers are happy with the systems running at stock speed and that they are welcome to overclock the system upon receiving it. However, any damage due to customer overclocking is not covered under iBuypower's warranty.

Not surprisingly, the system couldn't keep up with the rest of the pack when we loaded up the benchmarks, failing even to breach 16000 in 3DMark06. The system also encountered errors during PCMark05 that prevented us from getting a complete score. That said, the system provided reasonable frame rates in many of the game benchmarks.

The Gamer Paladin isn't a luxury PC . . . yet. The system has some great components, including a Panasonic SW-5582 Blu-ray drive, but the kinked watercooling and the PC's bum foot prevent it from taking on the top rung.

# Maingear Ephex SLI

**Ephex SLI**
$7,659.17
Maingear
www.maingear.com
CPUs: ●●●●◖

Specs: Intel Core 2 Extreme QX6850 @ 3.9GHz; Evga 122-CK-NF68-A1; 2GB Corsair CM2X1024-8500C5D; XFX GeForce 8800 Ultra (SLI); 150GB Western Digital Raptor WD1500ADFD (2x; RAID 0); 1TB Hitachi Deskstar 7K1000; Creative Labs Sound Blaster X-Fi XtremeGamer; 1kW SilverStone ST1000; Lite-On LH-2B1S; Windows Vista Ultimate 32-bit

The Ephex SLI is an intimidating PC, thanks to its extra large chassis. Maingear used the system's unique design and roomy interior to add a complex watercooling loop that features two radiators.

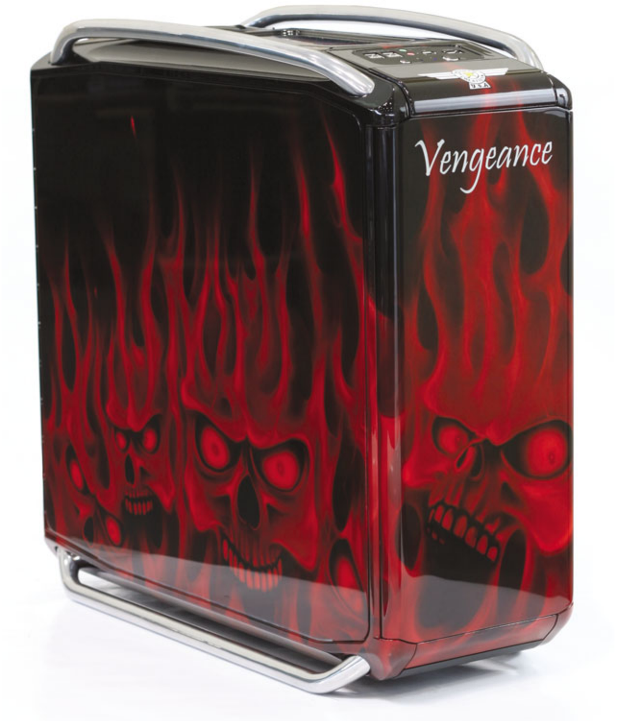
The larger radiator, which sits at the top of the case, has two 120mm fans. A smaller radiator sits at the center of the case and uses a 120mm fan to pull air from a large vent that runs through the middle of the PC. The Maingear Arctic Water Cooling system handles both of the XFX GeForce 8800 Ultras, as well as the highly overclocked 3.9Ghz Intel Core 2 Extreme QX6850.

The system's hard drives sit at the front of the PC, on the other side of this unusual mid-system vent. The two 150GB Western Digital WD1500ADFD Raptors and 1TB Hitachi Deskstar 7K100 fill the two drive cages, leaving three slots open for additional storage when you're ready to upgrade.

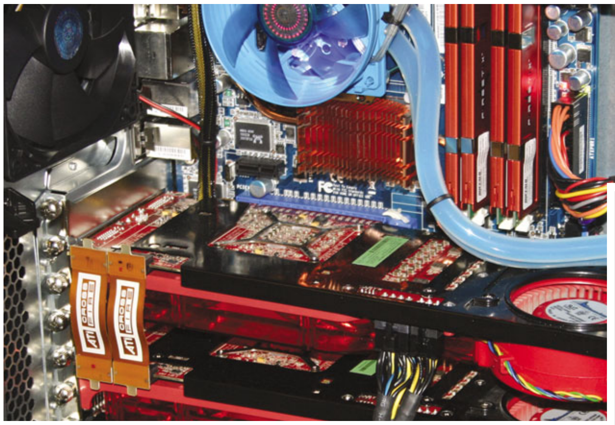
Having seen Vigor Gaming's PC belly flop at 3.8GHz, we expected the Ephex SLI's 3.9Ghz processor to choke at the first whiff of a benchmark. Instead, the gamer produced excellent scores with ease and remained stable throughout our rigorous testing process. The system scored no less than 19328 in 3DMark06 and posted 101fps in Oblivion.

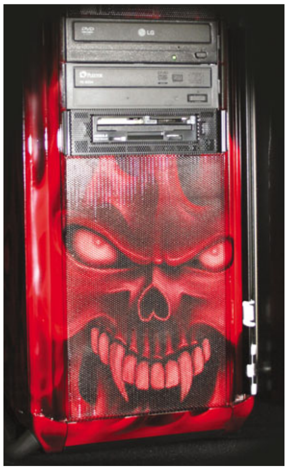
As much as we like this gaming beast, we're disappointed to see that Maingear neglected to paint the Ephex SLI. It offers paint jobs for its systems, including this one. We're not opposed to the rig's clean-cut, brushed aluminum chassis, but a high-end paint job is the icing that is clearly missing from this nearly perfect cake.

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT**



# Smooth Creations Vengeance





**Vengeance**
$7,250
Smooth Creations
www.smoothcreations.com
CPUs: ●●●◖

Specs: Intel Xeon 3230 @ 3.5GHz; Abit IP35 Pro; 4GB Buffalo FireStix FSX1200D2D-K2G ; 1GB AMD ATI Radeon HD 2900XT (CrossFire); 250GB Seagate Barracuda ST3250410AS (2x; RAID 0); 750GB Seagate Barracuda ST3750640AS; Creative Labs Sound Blaster X-Fi Audio; 1kW Cooler Master; Plextor PX-800A; LG DH-16D2P-04; Razer Death Adder (painted); Razer Tarantula (painted); Windows Vista Ultimate 32-bit

The first thing we noticed about Smooth Creations' Vengeance PC was its bright-red, demon face paint job, which encompasses nearly all of the PC's exterior and some of its interior. The second thing we noticed was that something inside the case was rattling. Both of the system's video cards had ripped free of the motherboard and bounced around the system in transit, chipping their own connectors and bending motherboard capacitors. Happily, Smooth Creations quickly sent us a replacement system that arrived in pristine condition.

The Vengeance paint job includes several demon faces, including one that appears on the front panel door. When we opened the door, we discovered that Smooth Creations painted a second face on the front panel itself. This is the sort of attention to detail that makes a luxury PC.

Surprisingly, Smooth Creations stocked the system with an Intel Xeon 3230 processsor, which it overclocked from 2.66GHz to 3.5GHz. "We prefer the 16MB L2 Cache (4MB per core) on this Xeon quad-core CPU," says production manager Josh McDonald. "It allows us to run a lower clock speed and still maintain the same performance. We also offer the QX6850 to customers if they'd prefer it."

Gamers who want to have the very highest benchmark scores will likely prefer the QX6850. The Vengeance's 3DMark06 score of 17359, while perfectly respectable, fell below that of many other systems in the roundup. The system's 9606 PCMark05 score failed to impress us at all, as did its frame rates in games.

Although Smooth Creations' painters have decades of experience painting and building PCs, the company itself is a new kid on the block. Vengeance is the system builder's first system to receive a review in *CPU* and, if we have anything to say about it, it won't be the last. The Vengeance's scores don't burn as bright as its fiery paint job, but it's a solid, gorgeous gaming system nonetheless.

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT**

# Vigor Gaming Force Recon QXN Sniper Edition

**Force Recon QXN Sniper Edition**
$6,299
Vigor Gaming
www.vigorgaming.com
CPUs: ●●●◖

**Specs:** Intel Core 2 Extreme QX6850 @ 3.7GHz; XFX MB-N680-ISH9; 2GB Mushkin XP2-9200; Evga GeForce 8800 Ultra (SLI); 1TB Hitachi Deskstar 7K1000 (2x: RAID 0); 1,300W Tagan TG1300-U33 ITZ Series; 2x Samsung SH-S183L; Logitech G5; Logitech G15; Windows Vista Ultimate 32-bit

Despite its top-shelf components and imposing stature, the Force Recon QXN Sniper Edition got off to a shaky start, crashing when we ran 3DMark06. Chuck Morris, a system engineer at Vigor Gaming, instructed us to reinstall the operating system via the original Windows disc.

The PC blue-screened repeatedly when we attempted the reinstallation, so we lowered the Intel Core 2 Extreme QX6850's clock speed (at Morris' instruction) from 3.8GHz until it finally stabilized at 3.7GHz. During our trial-and-error clock adjustments, Morris pointed out that he would have had the system returned to Vigor for repairs if we were customers.

Vigor Gaming's new Vigor Argonautica Cooling powered by Swiftech features a single radiator sandwiched between two 120mm fans at the back of the system. It cools the processor and both Evga GeForce 8800 Ultras. We're glad to see that the loop's tubing is kink-free.

The PC's cable management is reasonably tidy, but we found that some of the cables block the motherboard's trouble code LED display. Thanks to cable ties that held the cables firmly in place, we couldn't pull these cables out of the way. This wouldn't be a problem in a low-end PC, but enthusiasts will probably tinker with their luxury systems. That LED could come in handy if they encounter problems.

Once we found a stable clock speed, the Force Recon QXN offered up some solid benchmark scores, including 18151 in 3DMark06 and 96fps in Oblivion. The system also responded well when we played games.

Although the Force Recon QXN provided solid benchmark scores, we can't ignore the system's initial stability woes, particularly considering its purpose: to play the latest video games at high settings. We certainly like to see high overclocks, but stability is the key that separates the worthy PCs from the duds.

**CPU RANKING** ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**

# HP Blackbird 002

Leave it to Voodoo and HP to literally put the gaming PC on a pedestal. The new Blackbird, which features a large, custom case, appears to hover over its sturdy metal stand (PC and pedestal meet near the back of the system). And instead of sporting mascots or logos, the Blackbird's side panels bear more subtle (but no less eye-catching) designs. If you're tired of using the same Cooler Master, Lian-Li, and Thermaltake boxes, you'll love HP's artful twist on a PC chassis.

Of course, the Blackbird's chassis has plenty of functional features that you won't find in many standard cases. One of our favorite features is the front panel port module, which hides inside the chassis until you pop the module out of the top module. Thanks to this module, you can reach those ports and the system's media card reader easily enough, but you don't have to worry about dust or easy-to-break port covers.

As soon as we swung open the side panel (that's right, it swings), we noticed the Blackbird's liquid cooling system. The loop includes a large radiator (boasting two 120mm fans) at the top of the rig, a CPU waterblock, and waterblocks on both of the system's 1GB AMD ATI Radeon HD 2900XTs. HP uses panels to separate the motherboard into separate cooling zones: The CPU and memory have one airflow path, while the video cards have a separate area.

The Blackbird didn't knock us off our feet during benchmarks, but it provided consistently solid scores. The rig posted 17811 in 3DMark06 and encoded our test video in only 2:58 (minutes:seconds) during our Dr. DivX test. The system handled gameplay at high settings without trouble. Enthusiasts who are looking for a tough but cool new PC should check out this new rig. It can game and will get everyone's attention at the next LAN party.

**HP Blackbird 002**
$6250
HP
www.hp.com
CPUs: ●●●●◖

Specs: Intel Core 2 Extreme QX6850 @ 3.66GHz; Asus Striker Extreme: 2GB Corsair CM2X1024-8500C5D; 1GB AMD ATI Radeon HD 2900XT (CrossFire): 160GB Western Digital Raptor WD1600ADFS; 750GB Seagate ST375064; LG GGW-H10N; Samsung TS-T632L; Logitech G5, Logitech G11; Windows Vista Ultimate 32-bit

## Final Word

If we were buying a system, Maingear's Ephex SLI and Falcon Northwest's Mach V would top our list. Both systems positively ooze personality. The Mach V makes a better LAN party PC, as it's light and reasonably compact. Sure, you'll want to watch out for that paint job when you move the system from your car to the LAN party table, but the paint is pretty tough: We bumped into the system several times (the impromptu part of the testing process) without the Mach V sustaining so much as a ding. The Ephex SLI, on the other hand, has an imposing, tank-like posture and the best overclock in the house. Overclock bragging rights are nothing to sniff at, and neither is a spacious, ultra-clean case.

It's worth noting that both of these PC builders protect their systems in transit with exceptional custom packaging. Maingear uses a combination of cardboard and cushioning material. Falcon's setup is particularly foolproof: Air-filled plastic supports suspend the PC inside the packing, and all of the accessories ship in separate boxes. "It's the world's most expensive cardboard box," says Reeves. "The plastic suspension system keeps vibration from transferring to the PC, as well as providing shock protection. The scary thing is UPS has still managed to damage systems, but our shipping damage is way down from what it used to be using traditional packing methods."

Without a doubt, these are some of the best custom computers on the market today. Each system is more than a benchmark-shredding machine: Each is a luxury PC that provides a unique computing experience for its user. After weeks of running benchmarks, playing games, and poking around inside PCs that cost as much as cars, we're sorry to have to ship them back to their builders. ▲

**by Joshua Gulick**

| **Dream PC Scoreboard** | CyberPower Gamer Infinity SLI Extreme | Falcon NW Mach V | Hypersonic Sonic Boom OCX | iBuypower Gamer Paladin 884-UM | Maingear Ephex SLI | Smooth Creations Vengeance | Vigor Gaming Force Recon QXN Sniper Edition | HP Voodoo Blackbird 002 |
|---|---|---|---|---|---|---|---|---|
| **3DMark06** | | | | | | | | |
| Overall | 18219 | 19017 | 17932 | 15406 | 19328 | 17359 | 18151 | 17811 |
| SM2.0 | 7506 | 7748 | 7320 | 6091 | 7905 | 7156 | 7298 | 7382 |
| HDR/SM3.0 | 8506 | 8748 | 8284 | 7364 | 8924 | 7773 | 8519 | 8201 |
| CPU | 4831 | 5282 | 4923 | 4176 | 5295 | 4977 | 4957 | 4797 |
| **Cinebench 9.5*** | | | | | | | | |
| Single-threaded | :36 | :35 | :36 | :44 | :34 | :38 | :35 | :36 |
| Multithreaded | :11 | :11 | :11 | :13 | :10 | :11 | :11 | :11 |
| **Cinebench 10*** | | | | | | | | |
| Single-threaded | 3:55 | 3:53 | 3:59 | 4:48 | 3:41 | 4:07 | 3:54 | 3:56 |
| Multithreaded | 1:08 | 1:06 | 1:09 | 1:22 | 1:03 | 1:09 | 1:06 | 1:08 |
| Dr. DivX* | 3:13 | 2:49 | 3:05 | 3:26 | 3:00 | 3:00 | 3:15 | 2:58 |
| **PCMark05** | | | | | | | | |
| Overall | 11734 | 12577 | 11596 | N/A | 12107 | 9606 | 10309 | 10944 |
| CPU | 11551 | 11864 | 11250 | 9622 | 12505 | 11253 | 11852 | 11737 |
| Memory | 5014 | 5490 | 7252 | 4323 | 5269 | 5184 | 7062 | 4815 |
| Graphics | 16445 | 14656 | 15977 | 14556 | 15690 | 11451 | 13541 | 13661 |
| HDD | 8805 | 9425 | 8413 | N/A | 8359 | 7070 | 8920 | 6981 |
| POV-Ray 3.7 Beta** | 3135 | 3276 | 3145 | 2629 | 3432 | 3102 | 3247 | 3201 |
| WinRAR 3.7* | 2:29 | 1:47 | 2:03 | 2:46 | 2:18 | 1:44 | 2:14 | 2:35 |
| Company Of Heroes 1.71 | 35 | 15 | 35 | 31 | 37 | 14 | 37 | 15 |
| F.E.A.R. 1.08 4XAA/8XAF | 40 | 56 | 59 | 38 | 74 | 57 | 97 | 58 |
| Oblivion | 93 | 84 | 95 | 87 | 101 | 76 | 96 | 83 |
| S.T.A.L.K.E.R. 1.0003 | 70 | 51 | 70 | 63 | 73 | 46 | 72 | 52 |
| **CPUs** | ●●●◖ | ●●●●◖ | ●●●●◖ | ●●● | ●●●●◖ | ●●●◖ | ●●●◖ | ●●●●◖ |

*minutes:seconds **pixels per second ***Games tested at 2,560 x 1,600

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT**

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# Sub-$100 Superstars

## A Sextuplet Of Inkjets From A Trio Of Manufacturers

**Pixma iP1800**
$49.95
Canon
www.usa.canon.com
●●●

**Pixma iP4300**
$99.99
Canon
www.usa.canon.com
●●●●

It's startling what you can get for under $100—or even under $50—these days, and the broad mix of features among inkjets at that price is equally striking. In this roundup, we looked at six inkjet printers from three major manufacturers, each under $100 and each designed to perform double duty as both regular document printers and photo printers. And the extra features include frills such as direct printing to CD labels and integrated memory card readers; there's a little something for every possible user.

### Canon Pixma iP1800

A smaller, more compact cousin to Canon's iP4300 (also in this roundup), the iP1800 offers print quality that's nearly indistinguishable from the iP4300. But it lacks some of the more upscale features and doesn't print quite as fast. The iP1800 is a good choice if you still want the print quality of the iP4300 but don't need things like printing directly from a memory card or snappy print speeds.

The differences between the iP1800 and the iP4300 manifest in both big and little ways. For one, the iP1800 uses only two ink tanks: The CL-31 ($19.99) and PG-30 ($14.99) hold color and black ink, respectively. The iP4300, on the other hand, holds multiple ink tanks in addition to its black ink tank. In all print modes, the iP1800's output looked virtually the same as the iP4300, but the iP4300's extra ink tanks (and faster print speeds) are clearly better suited to heavier use. Photos in particular came out looking great: We noticed very little, if any, streaking or banding, and considerably less of the pronounced pixilation that we saw from HP's printers.

The calibration process is roughly the same as the HP printers: The iP1800 produces a test page from which you manually select the best-looking swatches of color. Several cleaning cycles are available—not only for the print nozzles but also the roller and the bottom plate. There's also a special cleaning mode for exceptionally clogged nozzles. Turn on quiet mode, which can also be set to run between particular hours of the day, and the iP1800 prints at roughly half-speed as a side effect of being quieter. Quiet mode does reduce the clatter and whirring of the print heads and paper feed. Duplex printing is supported, although you have to refeed the paper manually. (Handy on-screen directions appear to help guide you through the process.)

What's missing? For one, there's no memory card slot or USB docking bay for a memory card adapter, so you won't be printing directly from a camera or memory card. There's also no bottom paper tray, so you'll need to keep the area in front of the printer clear so the paper coming out doesn't run into anything. As we've said, the iP1800 prints slightly slower than its Canon cousin, but it does take a bit of extra time to straighten each page it feeds—a nice touch. Printing in draft mode, as opposed to normal mode, didn't produce a noticeable speed improvement, either. The bottom line: The iP1800 is quality at a bargain price.

### Canon Pixma iP4300

The Pixma iP4300 is the more "professional" of the two Canon printers in this roundup, and this is something that's expressed in a variety of ways. For a $100 printer, its output quality is remarkable, but as we've said, the iP1800's output is almost as remarkable. Consequently, the main reason to get the iP4300 over the iP1800 is its advanced features, even if

**CPU RANKING** ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**

**PhotoSmart D5069**
$69.99
HP
www.hp.com
●●●●

the iP4300 takes up that much more space on your desktop.

The iP4300 is meant for slightly heavier volume printing than the iP1800, and the biggest evidence of that is how it handles ink. Each color has its own ink tank, which lets you replace specific colors if they're depleted faster. And each print head is installed separately from its corresponding ink tank, so you can change either on its own if needed. The print heads calibrate automatically; there's no squinting at blurry boxes and picking the best one.

When you print, the iP4300 feeds paper from either the top or through the provided paper tray, which fits under the unit and holds a stack of paper 1/2-inch high. You can't load stickers and small photo paper in the cartridge, but most everything else works fine. We also didn't notice a difference in speed for paper loaded from the tray compared to paper fed through the top. Photos from the iP4300 were spectacular: They were so close to the pictures we got from a professional printer that it almost made no difference. The iP4300 also includes a PictBridge (USB) port for printing directly from a compatible camera, but it doesn't work like the USB port on the HP printers. You can't connect a memory card adapter and print from there.

Automatic two-sided printing was another impressive feature. The iP4300 will print one side of a page and automatically refeed it through, printing on the back side of the page. This does come at a bit of a speed hit, though: The 10-page print test took almost twice as long to print, even at draft quality.

Speed turned out to be one of the major issues we had with both Canon models. The iP4300 is downright sluggish in every aspect of its operation. The printer took its time waking up when we first turned it on and when we sent it a job after a period of idling. There's a good deal of whirring and gear-shifting before the paper finally gets sucked in, and when we first installed the ink, it took at least two minutes before it was ready to accept print jobs.

## HP PhotoSmart D5069

At less than 50 bucks, we were expecting the HP D5069 to handle either photo printing or regular printing well but stumble on the other. To our delight, it handled both with aplomb.

The D5069 was one of two printers in this roundup that let us print directly from a camera card without a PC. In fact, the D5069's front panel has a slot for just about every major memory card type, including a generic USB connector for plugging in a card adapter or camera connector. Cards plugged into the slots also register on the host PC (if it's connected) as removable drives. Press the printer's Proof Sheet button to get a thumbnail printout of all the available pictures. Then, just select the ones to print using the front panel controls, load the paper, and press Print.

Unlike the other printers in this roundup, the paper feeds in directly below the output tray, so the paper path is actually U-shaped instead of straight through—something to be mindful of if you're printing labels or sheets of preperforated business cards. Photo paper needs to be loaded in a special cartridge that comes with the printer. There's a hideaway storage bin for the cartridge on top of the printer, so you don't need to stick it in a desk drawer or risk losing it. For two-sided printing, there are handy onscreen instructions for how to manually refeed the paper.

The D5069's print times were among the best in this whole lot. Everything from plain documents to full-page pictures printed much more quickly than any of the competitors and looked about as good. There's very little warm-up noise or wait time. When you print, you don't receive notifications about the ink levels (the Lexmark printers do this, for instance), but you can get that information by drilling down through the printer's

**PhotoSmart D5160**
$89.99
HP
www.hp.com
●●●◖

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT driver menus. Although the D5069 doesn't have built-in network printing, it does have Bluetooth support via an adapter (purchased separately) that plugs into the front panel's USB port.

Photos printed from the D5069 generally showed a kind of speckling or dot pattern, which seems to be the printer's signature look. It wasn't distracting unless you look at a picture very closely, and there were no other major printing artifacts (banding, streaking, etc.) that detracted from the picture quality.

## Inkjet Drag Racing

We measured all print times from the start of paper feed to the last page deposited in the tray over an average of three runs. The test computer was a Sony VAIO VGN-TX770P notebook with 1GB RAM and Windows Vista. We used a USB 2.0 connection to the printers where applicable. All times are in (minutes:seconds). ▲

| Printer | Single page B&W (draft) | Single page B&W (normal) | 10 pages B&W (draft) | 10 pages B&W (normal) | Borderless 4x6 photo | Single page color (photo) |
|---|---|---|---|---|---|---|
| **Canon iP1800** | 0:08 | 0:08 | 1:20 | 1:24 | 1:10 | 1:48 |
| **Canon iP4300** | 0:05 | 0:17 | 0:54 | 1:04 | 0:35 | 0:48 |
| **HP D5069** | 0:04 | 0:09 | 0:35 | 1:37 | 0:55 | 1:25 |
| **HP D5160** | 0:07 | 0:12 | 1:15 | 1:42 | 1:08 | 1:36 |
| **Lexmark Z1420** | 0:05 | 0:09 | 0:56 | 1:23 | 2:30 | 4:20 |
| **Lexmark X2500** | 0:05 | 0:09 | 0:56 | 1:12 | 2:15 | 3:55 |

## HP PhotoSmart D5160

The D5160 is essentially the big brother to HP's D5069. It has about the same print quality but it adds a few other things, such as CD printing, that the D5069 doesn't have.

Unlike the D5069, the D5160 comes with an actual paper tray, not just a slot with a slide-out runner. The top part of the tray holds up to 20 sheets of photo paper; the bottom holds regular printer paper. You can toggle which one to use either from the printer's driver menu or from a front panel button. The size of the tray adds bulk to the D5160, and its body is also larger than the D5069's. If space is a consideration, you might want to consider a different printer.

Another major feature of the D5160 is a CD/DVD printing system, which lets you print directly on CDs or DVDs that have printable paper labels. The discs don't go into the printer directly; instead, load the discs into a cassette above the paper tray, which feeds the discs to the printer. Software included with the printer lets you create label designs if you don't have software that can do the job.

The D5160 sports the same front panel memory card slots as its smaller sibling. It accepts the following formats: Com-pactFlash, Microdrive, MMC, SD, xD, and Memory Stick. You don't need to connect the D5160 to a PC to print photos. Other features the D5160 shares with the D5069 are PictBridge compatibility and the ability to connect with Bluetooth-equipped devices, the latter of which requires the purchase of HP's optional Bluetooth adapter.

We mentioned that the D5160's picture and print quality was almost exactly the same as the D5069's. Pictures had the same slightly grainy signature look to them, but there was no banding or streaking. Aside from the grainy look, the D5160's photo prints stacked up nicely against the reference print. Its print speed was a little slower than the D5069's (most notably with the 10-page draft test), and there's a bit more "gear-shifting" before and after each print job, too.

## Lexmark Z1420

Lexmark's $80 Z1420 combines a basic inkjet printer and wireless 802.11b/g network printing. It's implemented well on the Z1420, so this printer will slip into your wireless network without skipping a beat.

When you pop in the installation CD, a graphical walkthrough guides you through every step of the printer driver and wireless network setup, so there's almost no chance of making a mistake. We did need to connect the printer to our PC via a USB port before we could set it up as a wireless device. (The same USB connection serves as a wired connection between the Z1420 and a PC.) The wireless setup process took about 10 minutes. It doesn't have an Ethernet port, so you'll need a printer server for any wired networked printing.

Once you've prepped the network connection and the drivers, you can print a calibration page. The Z1420's alignment

**Z1420**
$79.99
Lexmark
www.lexmark.com
●●●◖

## Printer Specs In Print

| Printer | Price | Dimensions (HxWxD, inches) | Color PPM (manufacturer estimate) | B&W PPM (manufacturer estimate) | Color resolution | B&W resolution | CPU rating |
|---|---|---|---|---|---|---|---|
| Canon iP1800 | $49.95 | 6 x 17.4 x 9.3 | 16 | 20 | 4,800 x 1,200dpi | 600 x 600dpi | ●●● |
| Canon iP4300 | $99.99 | 6.3 x 17.5 x 12 | 24 | 30 | 9,600 x 2,400dpi | 600 x 600dpi | ●●●● |
| HP D5069 | $49.95 | 6.2 x 18.3 x 9 | 24 | 30 | 4,800 x 1,200dpi | 1,200 x 1,200dpi | ●●●● |
| HP D5160 | $89.99 | 6.73 x 18 x 15 | 24 | 31 | 4,800 x 1,200dpi | 1,200 x 1,200dpi | ●●●●◖ |
| Lexmark Z1420 | $79.99 | 4.75 x 18.7 x 7.8 | 18 | 24 | 4,800 x 1,200dpi | 1,200 x 1,200dpi | ●●●●◖ |
| Lexmark X2500 | $59.99 | 6.9 x 16.9 x 11.5 | 16 | 22 | 4,800 x 1,200dpi | 1,200 x 1,200dpi | ●●●● |

process is entirely automatic, so there's no squinting at the test page and comparing fuzzy little boxes. If it doesn't receive a print job in about 30 minutes, it enters a reduced power mode; it automatically springs to life once you send a job.

Most of the Z1420's print speeds were identical to the X2500. Photo printing was a bit slower than the competition, although the Z1420 spent a lot less time idling and warming up than the Canon models did. Two-sided printing required manually reloading the paper, but you get on-screen instructions and (optionally) a printed instruction sheet for how to do this. Wireless print speeds were essentially the same as a wired connection because most of the bottleneck is in the print device itself.

Some slight horizontal streaking, which was fairly noticeable in solid patches of color, was all that marred otherwise acceptable photo prints. The included Lexmark Imaging Studio software lets you perform common organizing and printing tasks, such as making greeting cards or removing red-eye, with a wizard-driven interface.

### Lexmark X2500

It's striking how much you get for $59.99 in Lexmark's X2500 MFD. A 600 x 1,200dpi flatbed scanner/copier/color printer, the X2500 is a coffee maker away from being everything your office needs. About the only major feature missing is a sheet feeder for its 48-bit color scanner. Unless you extend its output tray, the printer takes up about as much space on your desk as a standard sheet of paper. Both the output tray and paper tray fold up for compact storage.

There's little question that Lexmark thoughtfully designed the X2500. First, we installed the ink cartridges and driver software, and then the printer spat out an alignment sheet. When we scanned this alignment sheet, the X2500 made the necessary calibrations automatically. It's a great way to handle one of the parts of setting up an inkjet printer that few of us are fond of; we personally hate squinting at all those little bars and trying to pick the best-looking one.

**X2500**
$59.99
Lexmark
www.lexmark.com
●●●●

The printer is fast enough, but the scanner itself is also pretty speedy: Using the standard TWAIN driver interface, we were able to scan a full-color, letter-sized page at 300dpi in about 25 seconds. A full-page color copy (which doesn't require a connected PC) took 1:20 (minutes:seconds); the X2500 needed a mere 15 seconds to make a letter-sized black-and-white copy. (Of course, copying times vary depending on how much material is on a given page; sparser pages print faster.) You can also detach the scanner cover to scan oversized originals, such as large books. The cover snapped back on without a fuss.

There's also a special photo-sized copy mode that lets you copy 4x6 images at the same size (again, without a PC). For fun, we copied a photo printed from the X2500 itself, and the quality of the copy was amazingly close to the original.

The X2500 handles photo printing the same way as printing on regular paper, although the quality is somewhat better than the Z1420. (There's less streaking.) Its photo prints didn't exhibit the graininess of the HP printers' prints, putting it roughly on-par with the Canon printers. (However, we still favored Canon's photo prints as the overall leaders.) However, there's no special photo-paper cartridge: You just adjust the guides on the paper tray, slide in blank photo paper short-side first, and print. ▲

**by Serdar Yegulalp**

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT

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**Intel® Core™ 2 Duo Processor**

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| Extreme QX6850 3.00Ghz | $ 2465 |
| (8MB Cache, 1066Mhz FSB) | |
| Quad Q6700 2.66Ghz | $ 1959 |
| Quad Q6600 2.40Ghz | $ 1675 |
| (4MB Cache, 1333Mhz FSB) | |
| E6850 3.00Ghz | $ 1675 |
| E6750 2.66Ghz | $ 1585 |
| E6550 2.40Ghz | $ 1559 |

## Gamer Infinity SLI™ Ultra

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**Hard core. Quad-core.**

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|---|---|
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| Extreme QX6850 3.00Ghz | $ 2035 |
| (8MB Cache, 1066Mhz FSB) | |
| Quad Q6700 2.66Ghz | $ 1529 |
| Quad Q6600 2.40Ghz | $ 1245 |
| (4MB Cache, 1333Mhz FSB) | |
| E6850 3.00Ghz | $ 1245 |
| E6750 2.66Ghz | $ 1155 |
| E6550 2.40Ghz | $ 1129 |

## Gamer Infinity SLI™ GS

NVIDIA® nForce® 650i SLI™ Chipset MB w/ Dual 16X PCI-E
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**Intel® Core™ 2 Duo Processor**

| | |
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| Extreme QX6850 3.00Ghz | $ 1895 |
| (8MB Cache, 1066Mhz FSB) | |
| Quad Q6700 2.66Ghz | $ 1395 |
| Quad Q6600 2.40Ghz | $ 1105 |
| (4MB Cache, 1333Mhz FSB) | |
| E6850 3.00Ghz | $ 1105 |
| E6750 2.66Ghz | $ 1015 |
| E6550 2.40Ghz | $ 995 |

## Gamer Infinity SLI™ GT

NVIDIA® nForce® 650i SLI™ MB w/ Dual 16X PCI-E
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320GB 7200RPM SATA-II 3.0Gb/s 16MB Cache Ultra Fast HD
(2) NVIDIA® Geforce® 8500 GT 512MB DDR. Powered by EVGA
20x DVD+/-RW Drive & 16 DVD ROM
High Definition 7.1 Surround Sound &
600 Watt Subwoofer Speaker System
Logitech 104 Keyboard and Optical Wheel Mouse
X-Jupiter Jr Mid-Tower Case w/ see Through Window
COOLERMASTER AQUAGATE S1 LIQUID COOLING SYSTEM
Free 802.11G Wireless PCI Network Adaptor
Add ViewSonic Q7B 17" Active Matrix Gaming LCD
Display for $195

**$995**

**Intel® Core™ 2 Duo Processor**

| | |
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| (8MB Cache, 1333Mhz FSB) | |
| Extreme QX6850 3.00Ghz | $ 1665 |
| (8MB Cache, 1066Mhz FSB) | |
| Quad Q6700 2.66Ghz | $ 1149 |
| Quad Q6600 2.40Ghz | $ 859 |
| (4MB Cache, 1333Mhz FSB) | |
| E6850 3.00Ghz | $ 859 |
| E6750 2.66Ghz | $ 769 |
| E6550 2.40Ghz | $ 749 |

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15.4" WSXGA TFT Display 1280x800 pixels
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1000/100/10 Network, 56K V.92 Fax/Modem
NVIDIA® Geforce® Go 8600 GT 512MB MMX II w/ HDMI
4-in-1 Built-in Media Card Reader, 3x USB 2.0 Ports,
1 IEEE-1394 Firewire Port, 1 PCMCIA Type II Slot,
3 Hours Battery Life, Weight only 6.8 Lbs, Free Carrying Case
6 Color to choose from

**Intel® Core™ 2 Duo Processor**
(800Mhz FSB)

| | |
|---|---|
| T7700 4MB L2 Cache, 2.40Ghz | $ 1285 |
| T7500 4MB L2 Cache, 2.20Ghz | $ 1205 |
| T7250 4MB L2 Cache, 2.00Ghz | $ 1159 |

**$1159**

**Free shipping**

## Gamer Xplorer X7-7700

Intel® Centrino® Duo processor technology
- Intel® Core™ 2 Duo Processor
- Mobile Intel® PM965 Express Chipset
- Intel® PRO/Wireless 4965a/b/g/n Network Connection

**Genuine Windows Vista™ Home Premium**
2048 MB DDR-II PC5300 667 Memory
160GB SATA150 Hard Drive
17" WXGA TFT Display 1600 x 1050 pixels
8x DVD+/-RW Drive
1000/100/10 Network, 56K V.92 Fax/Modem
NVIDIA® Geforce® Go 8600 GT 512MB MMX II w/HDMI
3-in-1 Built-in Media Card Reader, 3x USB 2.0 Ports,
1 IEEE-1394 Firewire Port, 1 PCMCIA Type II Slot
2 MP Build in Webcam & Finger Print Reader,
3 Hours Battery Life, Weight only 7.6 Lbs, Free Carrying Case

**Intel® Core™ 2 Duo Processor**
(800Mhz FSB)

| | |
|---|---|
| T7700 4MB L2 Cache, 2.40Ghz | $ 1549 |
| T7500 4MB L2 Cache, 2.20Ghz | $ 1469 |
| T7250 4MB L2 Cache, 2.00Ghz | $ 1425 |

**Free shipping**

**$1425**

**4802 Littlejohn Street, Baldwin Park, CA 91706 T: 626.813.7730 F: 626.813.3810**
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CyberPOWER Inc.

# Mtron MSD-PATA6025 & MSD-SATA6035

MSD-PATA6025 32GB
$1,999
●●●●◖

MSD-SATA6035 64GB
$2,999
Mtron
www.mtron.net (Distributed by
DVNation.com)
●●●●

With fast NAND flash memory and no moving parts, an SSD (solid-state disk) is tougher than a hard drive. It runs cooler and silently. It also draws less power, extending notebook battery life.

Mtron claims that with current NAND design and wear-leveling algorithms, you could rewrite 50GB per day for 140 *years* before you'd wear out an SSD. Data retention is estimated at 10 years with a 1 million-hour mean time before failure.

Reseller DVNation.com sent me a 64GB, 3.5-inch SATA SSD. I completed some preliminary tests with it before swapping it for a slightly faster 32GB, 2.5-inch IDE model. Both have five-year warranties.

The 32GB Mtron wouldn't boot Vista (and tech support was nonexistent), but it ran WinXP SP2 without trouble.

### 32GB IDE 2.5-inch SSD vs. Raptors

Test specs: WinXP Pro, Core 2 Duo 2.67GHz, 2GB DDR2-1066, Intel D975XBX2KR, Radeon HD 2600 XT

| | Mtron 32GB SSD | Raptor 150GB WD1500ADFD | 2x Raptor RAID 0 |
|---|---|---|---|
| Price | $1,999 | $249.99 | $499.98 |
| Interface | 44-pin IDE 100MBps | SATA 150MBps | SATA 150MBps |
| Boot to desktop* (min:sec) | 0:47 | 1:14 | 0:52 |
| S.T.A.L.K.E.R. Garbage level load* (min:sec) | 0:35 | 0:39 | 0:45 |
| PCMark05 1.2.0 (points) | 6814 | 6546 | 6850 |
| HDD Score (points) | 8811 | 6563 | 9793 |
| XP Startup (MBps) | 20.1 | 11.4 | 19.2 |
| Application Loading (MBps) | 15.9 | 9.6 | 11.7 |
| General Usage (MBps) | 13.8 | 8.4 | 12.4 |
| Virus Scan (MBps) | 74.8 | 98.1 | 91.2 |
| File Write (MBps) | 66.3 | 55.7 | 145.9 |
| 3DMark06 1.1.0 | 4944 | 4943 | 4950 |
| **HD Tach RW 3.0.4.0, Long Bench** | | | |
| Read rates, average/ maximum (MBps) | 77.5/78 | 75.5/88 | 130.5/150 |
| Random access time* (ms) | 0.1 | 8.1 | 8.5 |
| Write rates, average/ maximum (MBps) | 48.3/49 | 65.9/76 | 132.4/148 |
| Burst read rate (MBps) | 82.3 | 133 | 236.7 |
| CPU Utilization* (%, +/- 2%) | 6 | 3 | 5 |
| **Iometer 2006.07.27** | | | |
| File Server (IOps) | 556.4 | 157.49 | 290.17 |
| File Server (MBps) | 6.03 | 1.69 | 3.15 |
| File Server avg/ max response* (ms) | 28.8/162.2 | 101.6/269 | 55.1/1069.8 |
| Web Server (IOps) | 3845.32 | 180.88 | 326.86 |
| Web Server (MBps) | 58.8 | 2.72 | 4.96 |
| Web Server avg/ max response* (ms) | 16.6/69.9 | 353.5/831 | 195.5/1624.1 |

* Lower is better.

**Specs**: 44-pin (2.5-inch) IDE or SATA; <0.1ms access time; 7-bit ECC; bad block management and wear-leveling algorithms; 1 million-hour MTBF; 10-year data retention

The SSD cut XP boot time in half as compared to a Raptor WD1500ADFD, but it only shaved four seconds off a level load in S.T.A.L.K.E.R. The Mtron was the undisputed king of random accesses (representing the majority of requests a PC makes of a mass storage device), although its write performance was merely on par with a 7,200rpm drive. Still, its read rates beat even striped Raptors.

The obvious applications for SSDs are servers (check out those Iometer scores), notebooks and mobile electronics, military use, and aerial mapping from a helicopter.

Desktop productivity apps might benefit the most from an SSD's lightning-fast accesses. Multimedia encoding can get the same benefits from a hard drive RAID 0, as A/V files are sequential and typically large. (Then again, you could RAID two or more SSDs for some real fun.) Games may reap slight benefits, but if it takes an SSD to wake up your Oblivion rig, perhaps you really need more RAM.

So is a $1,999+ SSD worth it for desktop users ($1,499 for Mtron's SATA 32GB)? Not yet. Still, future generations will be faster and less expensive—probably much less expensive as STEC, SanDisk, and others pile on the competitive pressure.

Of course, there are cheaper alternatives. IDC says that a hybrid hard drive with 2GB or more NAND could virtually match an SSD's performance. However, only Vista currently takes advantage of hybrid drives' benefits.

Special thanks to Western Digital and Symantec for their assistance. ▲

(*Editor's Note: For MSD-SATA6035 performance data, go to www.cpumag.com/cpunov07/mtron*.)

**by Marty Sems**

**CPU RANKING** ○ **0 = ABSOLUTELY WORTHLESS** | ●●◖ **2.5 = ABSOLUTELY AVERAGE** | ●●●●● **5 = ABSOLUTELY PERFECT**

# PC Power & Cooling Silencer 750 Quad (Crossfire Edition)

This brilliant red S75CF has enough beef for most dual-card gaming systems, yet it's priced attractively at $199.99. It's CrossFire-certified for dual AMD Radeon HD 2900 XT cards, and it ran such a setup just fine for me. (It's also SLI-certified up to two 8800 GTXes.)

PC Power & Cooling really needs no introduction here, so suffice it to say that the company makes some of the most reliable desktop PC power supplies on the planet. Only industrial-grade components need apply, such as large capacitors that won't leave you with a hung system when your graphics cards suddenly floor it.

Huge finned sinks help the Silencer 750 Quad shed heat, and a quiet 80mm rear fan and the company's signature "air gap" help this PSU earn its Silencer name. Bend the cable bundle, and the PSU is an even 9 inches front to back, so it'll fit into most tower cases.

The S75CF's power factor is rated at .99, but in my tests, it gradually settled at .98. My CrossFire test system also had a 3GHz quad-core Intel QX6850, two 1GB sticks of Corsair Dominator DDR2-1,066, and single hard and optical drives. Four simultaneous threads of Prime95 and 3DMark06 couldn't bring this Silencer to its knees.

**Silencer 750 Quad Crossfire Edition**
$199.99
PC Power & Cooling
www.pcpower.com
● ● ● ●

On the downside, its 24-pin main connector isn't splittable down to 20-pin. And that's about all. It has a three-year warranty. ▲

**by Marty Sems**

| Continuous rated watts | Rated peak watts | +12V | +5V | +3.3V |
|---|---|---|---|---|
| 750 (40 C) | 825 (40 C) | 60A | 30A | 24A |

| Wattage max. tested | Case temp as tested | PF tested | Efficiency rating |
|---|---|---|---|
| 575 | 33 C | .98 | 83% |

**Specs:** Single rail; Connectors: 2 6-pin PCI-E, 2 (6+2) PCI-E, 6 SATA, 8 Molex, 24-pin main, 8-pin EPS12V, 1 4-pin 12V, 1 floppy; Active PFC; RoHS; 26-40dBA

# Pioneer BDC-2202

**BDC-2202**
$299
Pioneer
www.pioneerelectronics.com
● ● ●

Pioneer's new $299 BDC-2202 is a DVD/CD burner with modest specs and the key ability to read BD movies and data discs. It costs less than a BD burner or a BD write/HD DVD read combo drive but nearly twice as much as Microsoft's playback-only external HD DVD drive for the Xbox 360.

A VC1 and an MPEG-4 AVC BD movie both looked and sounded great on the Pioneer. My test system had a Core 2 Duo E6700, 2GB of 1,066MHz DDR2, a Radeon HD 2600 XT graphics card, CyberLink PowerDVD 7.3 Ultra, and Vista Home Premium.

In overall performance, this Pioneer falls between LG's GGW-H20L and Sony's BWU-100A, although it can't burn BD-R/RE media like those drives. It trails the LG by about a minute in most tests except for DL DVD+R burns. However, it beats or meets the Sony in its turn, although the Sony is a somewhat faster DVD ripper.

The BDC-2202 can't disguise the DVD+R/RW discs you burn as DVD-ROMs for increased compatibility, nor does it support LightScribe. It can run disc quality scans, however. It found very few faults with one of the Verbatim 4GB DVD-Rs it burned for me, awarding it a 99 (of 100) quality score in Nero CD-DVD Speed. On the other hand, the drive heavily faulted the layer break in the DVD+R DL it had produced.

Pioneer includes a Vista-compatible Corel software bundle with (the formerly InterVideo) WinDVD 8 LE and Ulead's VideoStudio 11 SE and Burn.Now SE applications. ▲

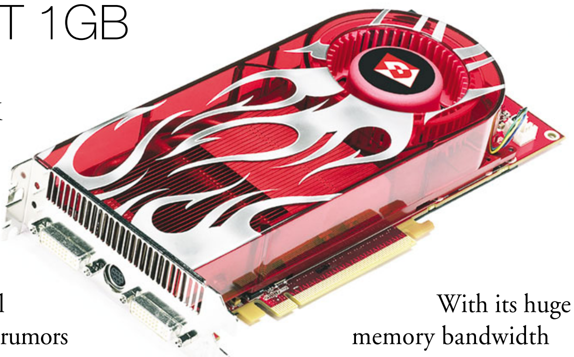
**by Marty Sems**

**Pioneer BDC-2202 BD-ROM DVD±RW SATA**
(firm. 1.01; 1X BD = 4.5MBps; hr:min:sec; Nero 7.9.6.0, CD-DVD Speed 4.7.5.0)

| 4GB DVD+R | 4GB DVD-R | 8GB DVD+R DL | 8.2GB DVD Rip |
|---|---|---|---|
| 7:50 (16X Verb @ 12X) | 7:28 (16X Verb @ 12X) | 26:58 (2.4X Verb @ 4X) | 27:08 (ISO) |
| **CD-Audio Burn (58m, Nero Exp)** | **CD Rip (58m, 128kbps WMA)** | **Read, avg/max** | **Access time, random/full (ms)** |
| 3:53 (52X Verb) | 3:38 (WMP11) | 3.79X/5.02X BD;<br>6.64X/11X DVD | 91/360 BD;<br>164/331 DVD |

**Specs:** 5X BD (read), 12X/6X/12X DVD±R/RW, 4X DVD+R DL, 5X DVD-RAM, 24X/24X/32X CD-RW; 2MB cache; SATA; One-year warranty

# Diamond Multimedia Viper HD 2900 XT 1GB



When AMD's ATI Radeon HD 2900 XT hit the scene, many enthusiasts were befuddled with what they saw. Prior to the card's launch, rumors circulated stating that AMD had an R600-based graphics card in the works with a GPU clocked around 900MHz and a huge frame buffer comprising 1GB of super-fast GDDR4 memory. When the actual product arrived, its GPU was clocked at only 743MHz, and its humdrum 512MB frame buffer ran at a somewhat mediocre 825MHz. Compared to Nvidia's GeForce 8800 GTX and Ultra, performance wasn't up to par.

To close the performance gap at the high end, some of AMD's partners have launched cards with specifications that fall somewhere between those early rumors and ATI's actual reference cards. Diamond Multimedia was one of the first out of the gate with its Viper HD 2900 XT 1GB.

The Viper HD 2900 XT 1GB sports the same 743MHz GPU (although an overclocked version is in the works) but sports 1GB of 1GHz (2GHz DDR) GDDR4 memory. With memory that fast, the card offers a staggering 128GBps of peak memory bandwidth. The GPU, PCB, and cooler remain unchanged.

With its huge memory bandwidth advantage, we expected the Viper to perform much better than a 512MB Radeon, but that wasn't the case. And the card's bundle is similarly uninspiring. The Viper HD 2900 XT 1GB might arguably be the fastest Radeon on the planet, but its meager performance gains didn't convince us it's the best. ▲

**by Marco Chiappetta**

| Benchmark Numbers* | ATI Radeon HD 2900 XT | Viper HD 2900 XT 1GB |
|---|---|---|
| 3DMark06 | 10,452 | 10,827 |
| Half Life 2: Episode 1 | 68.27 | 71.46 |
| F.E.A.R. | 55 | 58 |
| S.T.A.L.K.E.R.** | 33.97 | 36.21 |

* Games tested at 1,920 x 1,200 with 4XAA/16XAF.

** Tested at maximum AA/AF; full dynamic lighting enabled; grass shadows disabled.

Specs: Core Clock: 743 MHz; Frame Buffer: 1GB (1GHz); Outputs: 2 dual-link DVI, HDTV-out (HDMI via adapter)

**Viper HD 2900 XT 1GB**
$499.99
Diamond Multimedia
www.diamondmm.com
●●●

# Ultra Products X3 1000-Watt Modular Power Supply

In this age of 125W quad-core processors and power-hungry, multi-GPU rigs, it's more important than ever for an enthusiast to invest in a good power supply. Manufacturers have responded by flooding the market with quality units that boast high efficiency and maximum output ratings that hover around 1kW.

Ultra's 1,000W X3 offers massive amounts of power and a number of standout features. Ultra claims the X3 delivers an above average 85% efficiency rating and is one of the few 1kW units with a modular cable design. Not only that, but the included cables feature Ultra's Flex-Force cables, which in practice were much easier to manage than typical PSU cables and made routing them neatly throughout a case less painful. Another noteworthy feature of the X3 is its oversized 135mm cooling fan. The fan moved plenty of air, but the PSU remained quiet throughout all of my testing.

To test the X3, I connected it to a dual Xeon 5365-based system, complete with 4GB of RAM, a GeForce 8800 Ultra, two optical drives, and four hard drives. With the system's eight processor cores and an 8800 Ultra running under full load, the voltage output from the X3's 3.3V, 5V, and 12V rails remained rock solid, and the system was perfectly stable for hours on end. My tests showed efficiency of the PSU was close to Ultra's claim. The X3 yielded idle and load power consumption numbers of 310W and 488W, respectively. With a Cooler Master 850W PSU connected to the same system, it drew 315W at idle and 494W under load. Swapping that PSU out for an 850W Cooler Master PSU yielded idle and load power consumption numbers of 315W and 494W, respectively.

At almost $300, the 1kW Ultra X3 isn't cheap, but it is competitively priced. And its features and performance make it well worth the investment. ▲

**by Marco Chiappetta**

Specs: Single 12V rail; Cables: 24-pin main; 4-pin 12V, 8-pin EPS12V, 4 6-pin PCI-E, 2 8-pin PCI-E, 2 5-pin SATA (3 devices); 2 5-pin SATA (2 devices), 1 Molex (2 devices), 2 Molex (2 devices, 2 floppy), 1 Molex (3 devices), 1 Molex (1 device), 3-pin fan (3 fans); Active PFC; Lifetime warranty

**X3 1000-Watt Modular Power Supply**
$299.99
Ultra Products
www.ultraproducts.com
●●●●

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT**

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www.GlobalNightPC.com

# Corsair Flash Padlock 2GB

How many times have you lent a USB flash drive to a friend or business colleague and wondered to yourself: "Wow, I hope there's nothing on there that I don't want seen." Now, this probably wasn't because you necessarily had anything incriminating on there, but more likely it was just the feeling that you were giving someone else access to, in the immortal words of George Carlin, "your stuff." Let's face it people, sometimes you simply have to lock up your stuff.

Corsair has an answer to this problem ol' George prophesized for those of us firmly entrenched in the information age. The Corsair Flash Padlock USB drive will hold up to two gigs of your stuff and let you lock it down by entering a PIN on its integrated 5-button keypad. Of course, a flash drive with this capability will attract corporate and legal types, but casual users need quick, secure storage media, too.

With a built-in security processor, the Flash Padlock offers self-contained, hardware-based encryption for any PIN you enter into the drive. This technology is significantly more secure than preinstalled software-based encryption apps found on other flash drives, because it requires no interaction with the host computer or any software.

Operating the Flash Padlock is easy. If you don't create a PIN, the drive operates and responds to the OS like any other flash drive. However, once you create a PIN, the drive isn't even visible to the OS. To unlock the drive, simply enter your PIN, and the drive will be accessible for 15 seconds; once you plug it in, it will remain unlocked in the system indefinitely. When you remove the drive, it will lock itself again in 15 seconds. In the event you lose your PIN and lock yourself out of the drive, Corsair offers a Flash Padlock PIN registration service for free. Read/write performance was uninspiring, but obviously that's not the Flash Padlock's focus. Want to secure that stuff? Corsair's Flash Padlock has you covered. ▲

**by Dave Altavilla**

**Specs:** Capacity: 2GB; Autolocking; Customizable PIN, 5-button keypad; 10-year warranty

**Flash Padlock 2GB**
$39.99
Corsair
www.corsair.com
●●●●

# Imation Odyssey Removable Hard Disk Storage System

Imation has been in the storage and media business—dare we say—since the beginning of dirt. From CD-R media, to tape backup, flash thumb drives, and removable hard drives, there are few removable storage technologies Imation hasn't dabbled in. We recently spent some time with Imation's latest release in the oh-so-crowded USB hard drive market, a cartridge-based system called Odyssey.

The unit we tested was configured with an 80GB cartridge, and Imation currently offers capacities ranging from 40 to 250GB. This might seem a little on the small side to some of you, but Odyssey's cartridge technology is currently based on 2.5-inch mobile hard disks, which allows for a significantly more portable cartridge-based design. The Odyssey's hard drive cartridges are also built with durability in mind: They're able to withstand a 900 g-force shock, although Imation doesn't indicate whether this is during operation or when powered down. (We'd suspect it's the latter scenario.)

Odyssey cartridges eject from the drive at the touch of the unit's status button, which also flashes red or green to indicate power state, as well as access activity. In our tests, the Odyssey drive actually put up some very respectable performance numbers, at 18.6MBps and 14.6MBps for reads and writes, respectively. In a backup scenario, this equates to about 875MB per minute. Comparatively, one of our faster 8GB flash drives put up 14.3MBps for reads and 11.7MBps on writes over the same USB 2.0 port.

Bundled with EMC's Retrospect backup software, the Odyssey 80GB unit lists for $299.99. When you consider there are other external USB drives on the market, such as WD's 500GB My Book (which sells for under $150), it's hard to justify the Odyssey's cost. You do get a significantly more rugged and portable solution, but Imation simply has to work harder to get its pricing in line with the competition. ▲

**by Dave Altavilla**

**Specs:** USB 2.0 interface; Dimensions (docking station): 2.04 x 5.25 x 7.84 inches (HxWxD); Dimensions (cartridges): .38 x 3.21 x 4.98 inches; electrostatic discharge protection up to 5,000 volts; 3-year warranty

**Odyssey Removable Hard Disk Storage System**
$299.99 (80GB)
Imation
www.imation.com
●●●

**CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ●●◖ 2.5 = ABSOLUTELY AVERAGE | ●●●●● 5 = ABSOLUTELY PERFECT**

# So How Do You Like Your iPhone?

by Anand Lal Shimpi

I was recently out in Denver covering CEDIA and was absolutely shocked by how many iPhones there were in one place. Everyone had one; at one point during a Silicon Optix party I attended, I was talking to three people and all of us had one. It is a great phone and it seems to be the thing to have these days. The last time I remember a phone being this hot was when the first Motorola StarTAC flip phones came out years ago; I remember going to a trade show where everyone had one but me. I did my best to hide my aging phone.

Despite the prevalence of iPhones at these technology conferences, there are still not very many of them out in the world—only about a million as of now. In contrast, there are far more smartphones in general and definitely many more regular cell phones, so chances are most people haven't been exposed to an iPhone.

Knowing this, you'd think I wouldn't be surprised when I still get asked what I think about the iPhone. I guess I just assume everyone sits at home reading reviews on the day a product launches, but apparently the rest of the world has better things to do with their mornings. Go figure.

I've been keeping a running log of my iPhone observations ever since my initial review went up, and although I'd still take it over any other phone, the iPhone isn't without its issues.

When the first iPhone previews came out, everyone complained about Edge performance and AT&T's network in general. When I first started using the iPhone, I didn't really see a problem with either, but living and, more importantly, traveling with the phone gave me a very different experience. Edge itself is fine for email and even Web browsing if you're getting full signal strength and you're not moving. However, try using it on the move (for example, as a passenger in a car) or in a low-signal area and it quickly becomes the most frustrating thing in the world. The iPhone's usually lightning-quick UI stops mattering, and the fact that it's taking multiple minutes to load a Web page all of a sudden stops being quite so funny.

During the launch, everyone whined that the iPhone was an AT&T exclusive; I didn't really get the complaint, it had been a few years since I'd been on AT&T and I didn't remember it being terrible. I had been on T-Mobile for a while and I really liked my experience there, but how bad could AT&T really be? It hasn't been terrible, but I generally have the worst signal strength in any group I'm in anywhere, and despite the commercials I've had more dropped calls with the iPhone and AT&T than with my BlackBerrys on T-Mobile. I get that this is quite anecdotal and the iPhone could be just as much at fault as AT&T, but that's been my experience.

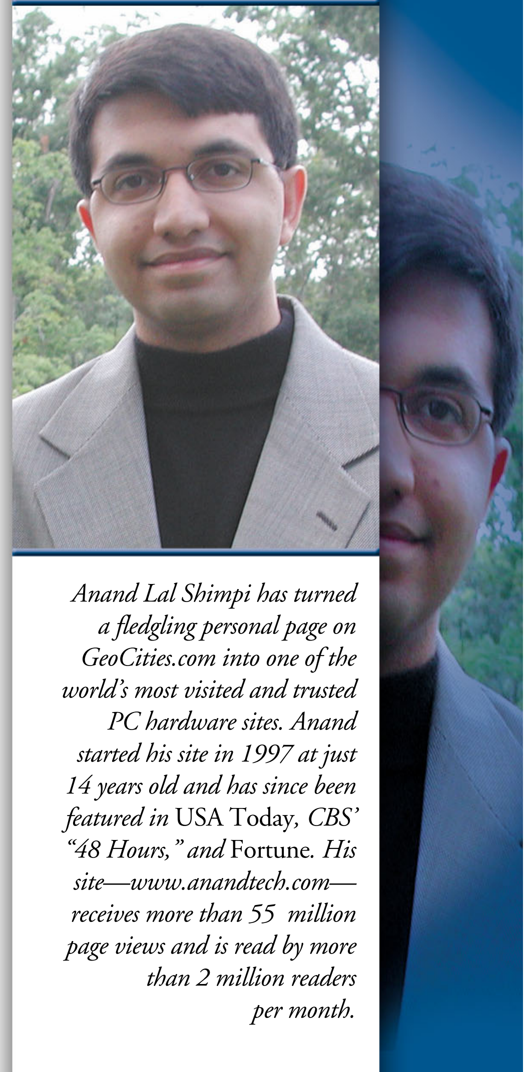
Speaking of signal strength, will someone please get the iPhone a faster CPU? If the iPhone is switching between Edge and GPRS or in very low signal strength situations, the UI tends to slow to a crawl. You can still type and navigate, but you have to type a bit and then wait a couple of seconds for the iPhone to catch up—so you'd better be good with that keyboard or have a ridiculous amount of patience.

Then there are the basic problems that were evident from day one: You can't copy and paste, you can't search, and there's no support for push Gmail; such limitations just become more frustrating over time.

Battery life is a major issue for me when traveling, as my days will run from the morning until the late evening (I usually get back to the hotel room by around 10 or 11 p.m.). By late dinner the iPhone is usually dead, especially if I've been using it in low-signal situations.

I still stand by my recommendations. I think the iPhone is truly a joy to use, but I also very much hope that its list of problems will be addressed in making the iPhone 2 that much better. ▲

Talk back to Anand at anand@cpumag.com.



*Anand Lal Shimpi has turned a fledgling personal page on GeoCities.com into one of the world's most visited and trusted PC hardware sites. Anand started his site in 1997 at just 14 years old and has since been featured in* USA Today*, CBS' "48 Hours," and* Fortune*. His site—www.anandtech.com—receives more than 55 million page views and is read by more than 2 million readers per month.*

The last time I remember a phone being this hot was when the first Motorola StarTAC flip phones came out years ago . . . .

# Hungary For iPod

by Alex "Sharky" Ross

*Disrupting Reuters' newswire with a cheery Christmas greeting at age six, Alex "Sharky" Ross became an avid computer user/abuser, eventually founding popular hardware testing/review Web site SharkyExtreme.com. Exposing shoddy manufacturing practices and rubbish-spouting marketing weasels while championing innovative products, illuminating new technology, and pioneering real-world testing methods was just a front for playing with the best toys. The site acquired, he left in 2001. A London native and London School of Economics graduate, Alex currently overclocks/tunes Porsche 996 Turbos with www.sharkwerks.com when he's not tweaking PCs.*

Working with overclocked Porsches doesn't necessarily mean that I have forgotten my geek roots. Whilst one half of me is in pursuit of more horsepower out of Porsche 2007 997 Twin Turbos, the other half is desperately trying to integrate an iPod into the fiber-optic nightmare that is a MOST-based Bose in-car audio system (using that term loosely). Being an avid iPod (and now iPhone) user as well as a Porsche addict, it's bugged me for some time that the two can't work together flawlessly. In-dash CD players are a thing of the past, and even with a 6-CD changer in the front, it just doesn't compare to having 80GB's worth of MP3s at your disposal. Enter the Dension Gateway Icelink 500 iPod adapter kit all the way from Hungary. If you own any relatively new European car (Audi, Porsche, Mercedes, etc.), it's more than likely that your factory in-car audio uses the MOST data bus system and until recently had no elegant way of integrating your iPod. But you can now take the audio signal of the iPod and adapt it to directly play through your factory radio without any loss in quality.

The Gateway Icelink 500 can also be used for other external audio sources utilizing its other audio ports, including USB (this comes in handy for firmware updates) and two AUX line-in ports. You can even listen to music using some of those USB storage devices or card readers if you want, although don't try connecting an iPhone. There's a Video Out port for rear-seat entertainment systems—OK, a moot point in Porsches usually. Whilst the iPod is plugged in, it also keeps on charging, so there's no need to rely on battery power for those long trips. Most importantly, having a fiber optic-based system no longer hampers you from integrating your iPod and music collection with your car. You don't need those crude FM-transmitter adapter kits that severely downgrade the quality of your iPod's audio files. The Gateway 500 mimics, and in some cases replaces, your factory CD-changer.

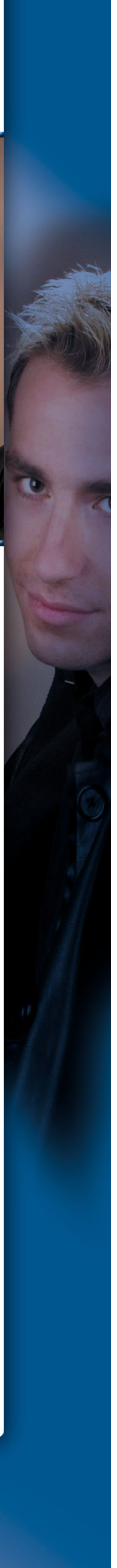
It's not without flaws. The PCM interface on Porsches is quite poor to begin with. Couple that with the fact that the Dension isn't super-easy to navigate and you've got a few issues. Installation isn't super-easy and usually requires some handiwork, careful rewiring, splicing, and soldering. If the back of your home theater setup or PC looks remotely like a bowl of spaghetti, then take your car, iPod, and Dension unit to a professional installer. Getting it up and running, assuming you've installed the unit correctly, is somewhat confusing. Different cars and audio systems have varying degrees of compatibility with the Dension. Some cars even retain full steering wheel control buttons. Navigating the menus doesn't always make sense, and it depends on what flavor of audio system your car is kitted with. For example, Porsches or Audis with a factory-installed navigation unit tend to give you the most options where navigation and displaying your iPod's albums and songs is concerned. Those of you with more simple setups should stick to creating playlists that are much easier to navigate using your car's radio controls. And don't try installing the Bluetooth adapter expecting it to work flawlessly. It seems as though more firmware updates are needed before you can use both your iPod and Bluetooth device at the same time.

In some cars, placement of the iPod is best in the center console, and thus you need an additional $50 extension cable, which is also available from Dension. For the pricey $500 outlay, Dension should really have included it in the kit along with some "proper" instructions. Even though they are available in many languages, the English version was not only confusing but missing some of the vital steps and explanations. Luckily, the Internet is full of helpful pictorials and installations for specific cars. Even within one marquee, I found the setup/installation quite different for the Porsche Cayman S, 997 TT, 997S, and GT3RS.

It's early days for these car iPod adapters, and although there are other choices, including those offered by DICE and NAV-TV, the Dension unit seems to be the current front-runner. For more info, head over to www.dension.com. ▲

> Being an avid iPod (and now iPhone) user as well as a Porsche addict, it's bugged me for some time that the two can't work together flawlessly.

Email me at sharky@cpumag.com



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www.lian-li.com

# Aluminum Case

Design to be cool

PC-A71

PC-A70

## SERVER CASE

**HDD anti-vibration rubber rings.**
**Removable/washable fan filter.**
**HDD cage can be turned 180 degree.**
**VGA card pillar extension.**

- Device: 5.25" bay x5, 3.5" internal x10(removable x3)
- Fan: 12cm ball bearing fan x6 (Fan speed:1500 rpm)
- M/B type: EXT ATX (max size: 12"x13")
- Top I/O: USB2.0 x 2, IEEE1394 x 1, MIC x 1, EAR x 1
- Dim:220x595x590mm (W,H,D) PC-A70
- Dim:220x595x615mm (W,H,D) PC-A71

## PC-A01 MINI TOWER

### Lian li originate design: Fan less

**Can be placed vertically or horizontally.**
**CD-ROM easy assembling module.**
**Spare 8cm fan mount.**
**Magic space for 28cm VGA card.**
**Movable plate with spare CPU cooler.**

- Device: 5.25" bay x1, 3.5" bay x2, 3.5" internal x1
- Fan: None; spare for 8cm fan mount x1
- M/B type: Micro ATX (max size: 9.6"x9.6")
- P/S type: Standard ATX Power
- Top I/O: USB2.0 x 2, IEEE1394 x 1, MIC x 1, EAR x 1
- Dim: 160x360x410mm (W,H,D)

## PC-B25 CLASSICAL SILENT

### Double-layer designed side panel

**HDD cage can be turned 180 degree,**
**in order to marshal wires.**
**Blue lighting design for the front panel.**

- Device: 5.25" bay x3, 3.5" bayx1, 3.5" internal x5
- Fan: 12cm ball bearing fan x3 (Fan speed:1500 rpm)
- M/B type: ATX (max size:12" x 9.6")
- Top I/O: USB2.0 x2, IEEE1394 x1, MIC x1, EAR x1
- Dim: 210x450x515mm (W.H.D)

**LIAN LI INDUSTRIAL CO., LTD.** Tel: 886-2-2451-3000 Fax: 886-2-2452-5659 www.lian-li.com

# PC Modder

## Tips & Tutorials

**Modding does the body good. A PC's body, anyway, inside and out. Here you'll find hardware, firmware, tools, tips, and tutorials for modding your rig's performance and appearance. Send us your own mod-related tips and ideas at modding@cpumag.com.**

Modding enthusiasts have a penchant for the latest toys. Fast processors, powerful video cards, silent SFF enclosures, and radically lit motherboards are all fair game when it comes to a modder's creative mind. Recognizing the appeal of unconventional customization, an entire industry has emerged to support the community.

## Mods & Ends

### CoolIT Systems MTEC Control Center

Users of CoolIT's hybrid water/thermoelectric coolers have a new tool at their disposal, the MTEC Control Center. Out of the box, coolers like the CoolIT Freezone and Eliminator are self-contained units that don't give users control over much beyond fan speeds. But with the new MTEC Control Center, which replaces the thermal control module included with these coolers, users can now manipulate key settings from within Windows. The MTEC Control Center ($119.99) can automatically adjust the fan speed and power supplied to the coolers' TEC units. It also features a new Predictive Cooling mode.

Predictive Cooling works by monitoring the CPU temperature and increasing cooling power as soon as it starts to rise. The ultimate goal is keeping the CPU temperature as stable as possible. Unlike most other systems, which only spin-up CPU fans once temperatures reach an upper threshold, this is a superior method for CPU cooling because there are no wild swings in temperature.

CoolIT's MTEC Control Center adds new features and capabilities to the company's line of water/thermoelectric coolers.

### OCZ Vindicator

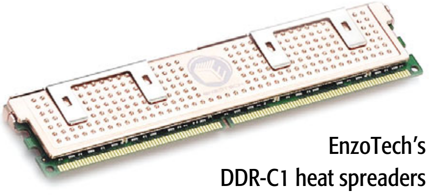
The best CPU air-coolers have a couple of things in common. They all have massive amounts of surface area to quickly dissipate heat and fans that can circulate large amounts of air over the heatsink's fins to keep temperatures as low as possible. But only a select few CPU coolers are as large as OCZ's 15 x 11 x 11cm (HxWxD) Vindicator ($49.99).

The Vindicator is a tower-type CPU cooler that features a solid copper base and six heatpipes that are connected to an array of oversized aluminum fins. The heatsink is so big, in fact, that it can passively cool some processors. (OCZ doesn't list specific CPUs, but it's safe to say you won't be passively cooling your X6800.) For ultimate performance, however, you can mount the included 12cm fan to the Vindicator's side. The Vindicator is compatible with AMD Socket 754/939/940/AM2 and Intel LGA775 processors.

The OCZ Vindicator CPU cooler has so much surface area that it can passively cool some processors.

### EnzoTech DDR-C1

With the exception of some high-end modules from well-known manufacturers such as Corsair and OCZ, most system memory is outfitted with only basic, flat, aluminum heat spreaders (if it has any additional cooling at all). To remedy this situation, the folks at EnzoTech have developed a set of forged copper RAM heat spreaders that are vastly superior to most stock RAM cooling.



EnzoTech's DDR-C1 heat spreaders are thicker, denser, and have more surface area than most stock RAM coolers.

The EnzoTech DDR-C1 heat spreaders ($13.99) feature a "pin fin" design to maximize surface area and are manufactured using a unique process that creates very dense thermal material, which is a stark contrast to traditional heat spreaders. They're also twice the thickness of most others, which increases their volume (and thus heat dissipation) significantly. This naturally boosts your memory's stability, longevity, and overclockability.

## Fashionably Fresh Firmware

### Linksys WRT54G (v8.00.2)

The latest firmware for the Linksys WRT54G fixes problems with the DHCP relay agent, uPNP, and interoperability with the WAP54G access point (in repeater mode). It also updates the daylight savings schedule and the Web GUI help section in the Access Restrictions menu.

www.linksys.com

### Apple Mac Pro SMC (v1.1)

A recent SMC (System Management Controller) firmware update for the Mac Pro and Mac Pro 8-core adjusts the systems' cooling fan behavior for better performance.

www.apple.com

### Lite-On LH-20A1S (v9L02)

An update for Lite-On's LH-20A1S internal DVD burner enhances the compatibility and performance of the drive with more types of recordable media.

www.liteonit.com

**by Marco Chiappetta**

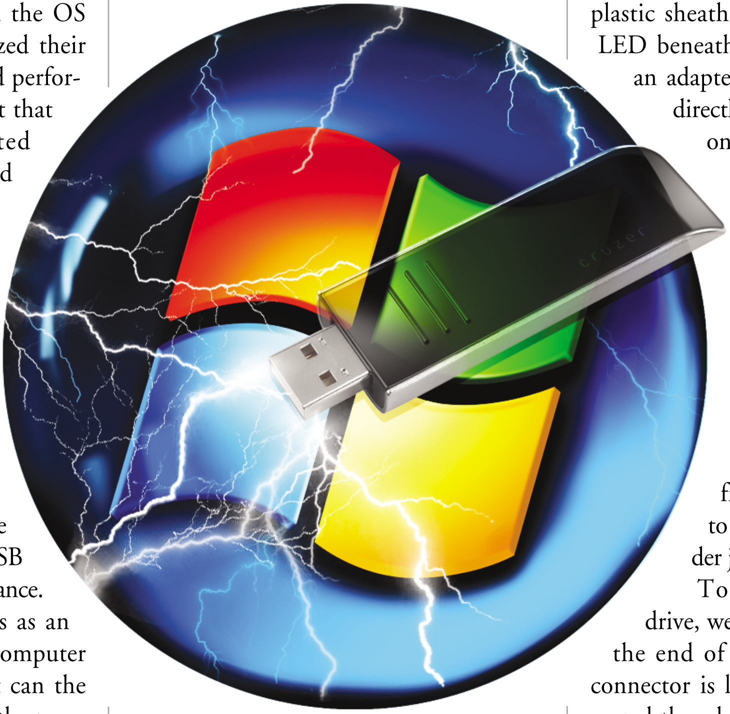
# ReadyBoost Internalized

## Mod Vista's Memory Tweaker

Upon its arrival, Windows Vista wasn't very well received. In comparison to the much more mature Windows XP, Vista seemed slow and clunky, not to mention the numerous driver issues and general quirkiness that early adopters had to deal with. Over the last few months, however, Vista has gained traction with power users, as Microsoft has patched the OS and manufacturers have optimized their drivers for increased stability and performance. Couple this with the fact that a handful of highly anticipated DirectX 10 games have arrived (with more on the horizon), and running Vista has become somewhat of a necessity. This situation has sent many enthusiasts on the hunt for Vista tweaks and mods to further enhance its performance.

One of these tweaks that Microsoft heralds is ReadyBoost. If you're unfamiliar with ReadyBoost, it lets users use a nonvolatile flash memory device, such as a USB thumb drive, to improve performance. The flash memory device serves as an additional data cache that the computer can access more quickly than it can the hard drive. It basically duplicates the pagefile on the flash drive, and your system accesses the pagefile there rather than on the hard drive, significantly decreasing access times. ReadyBoost also benefits from the new memory management techniques in Vista's SuperFetch feature to improve system responsiveness and load times as it learns usage patterns.

Using ReadyBoost is as simple as plugging a supported flash drive into an available USB port and clicking the "Speed Up My System" option when prompted. We fully explain how to take advantage of ReadyBoost in the August 2007 issue of *CPU* (see page 39) and detail a number of other Vista tweaks in that article, as well. We suggest taking a look at that article if you want to speed up a Vista-based PC. As modders who love to tinker with our rigs, one issue we have with ReadyBoost is that it's just so darn anticlimactic. Plug in a flash drive, and a couple of mouse clicks later, you're done. Booooring.



We decided it was time to add a bit of flair to ReadyBoost and to build a custom internal ReadyBoost drive using nothing more than a few spare parts, a USB flash drive, and a little ingenuity. We wanted to make the drive internal for a few reasons. First, it makes it much harder for a sticky-fingered lowlife to snag a flash drive when it's connected inside a system. Second, external USB ports are prime real estate now that virtually everything from game pads to scanners use them. And finally, we've seen too many crushed flash drives after colleagues plugged them into the backs of their systems and pushed their cases up against a wall too quickly. Crunch.

### Rip It Up

We began this project with a generic, ReadyBoost-compatible 4GB USB flash drive and a spare dual-USB port accessory plate that came with a motherboard. Our goal was to rid the flash drive of its plain, plastic sheath to show off the PCB and LED beneath. Then, we would fashion an adapter that let us plug the drive directly into an open USB header on a motherboard.

The first thing we did was basically rip everything apart. Using a razor blade, we carefully sliced the rubber sheath from the cables on the USB accessory plate and then unscrewed the actual ports from their metal bracket. Then, we pried the casing from around the USB ports to uncover the individual solder joints for the connectors.

To disassemble the thumb drive, we removed the plastic ring at the end of the drive where the USB connector is located. Then, we carefully scored the edges of the drive's housing to cut through any glue and make it easier to pry it open. We cracked it open, and the PCB slid right out.

### Make The Connections

With all of the parts disassembled, we gathered our trusty soldering iron and solder, some wire cutters, heat shrink tubing, a razor blade, and electrical tape. We removed one set of black, green, white, and red wires from the blue internal USB connector because we only needed one set for the drive. Each side of the internal USB connector had four wires that connected to the two ports; we only planned to use one port, however. To remove the small wires, we used the razor blade to pry up the small tabs that held the wires (and their pins) in place and simply pulled them from the connector, one at a time.

Once we pared down the connector to a single set of wires and one port, we used wire cutters to cut the wires near the internal connector, leaving about an inch of wire still connected. Then, we carefully stripped about 1/8-inch of sheathing from each of the wires. This is what will eventually be soldered back to the port. Be careful when stripping the wires, because they are quite thin and easy to break. And it becomes increasingly difficult to make the solder connections as the wires get shorter.

Next we had to remove the leftover pieces of wire from the back of the USB port. To do this, we heated up the individual solder joints with our soldering iron and lightly tugged on the wires once the solder had melted. It is of paramount importance that you pay attention to the orientation of the wires at this stage because you could damage the flash drive or the USB header on the motherboard if you reconnect them in the wrong order. The wires will usually be connected in the following order: Ground (either black or exposed), black (Ground), green (+DATA), white (-DATA), and red (+5V). Some older motherboards may not use this orientation (but they're probably too old to be running Vista anyway), or the USB port accessory plate may have nonstandard colored wiring. So before cutting anything apart and trying this mod yourself, make sure to write down where each wire originally connected. We were fortunate enough to be documenting the process with digital photos that were easy to reference throughout the process.

With the leftover wires removed, we could then solder the short wires and internal connector back onto the USB port. Our connector had an unsheathed ground wire that needed to be soldered to the metal can that surrounded the port. Then we carefully soldered the individual wires to the correct pins in the order mentioned above. Once we made the solder connections, we thoroughly inspected the pins to make sure there were no short circuits and gently

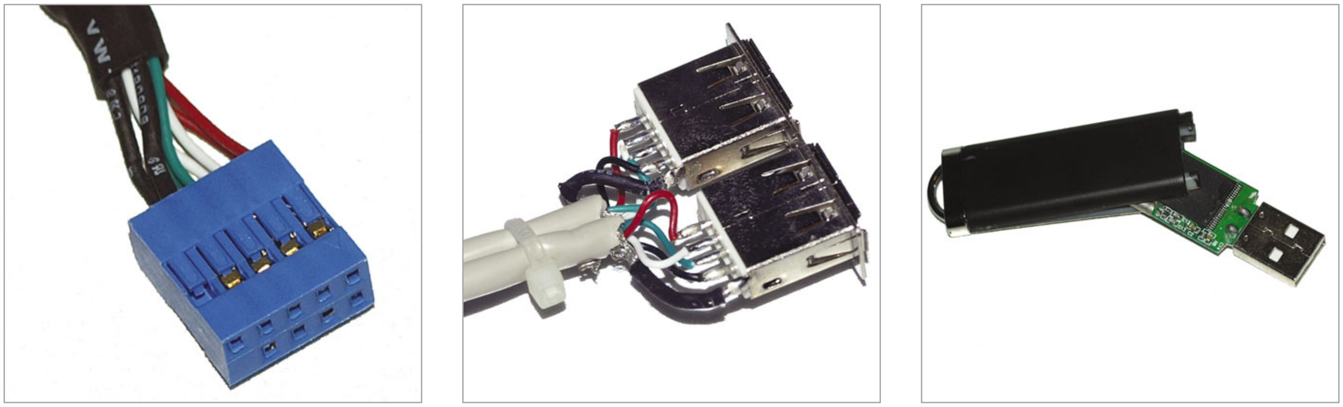
## Proceed With Caution: Hardwiring Is Hard

The more astute soldering specialists among you may be wondering why we didn't just solder an internal USB connector directly to the pins on the flash drive's PCB? Well, the short answer is: "We tried." And the final product would have ultimately been sleeker. But it turned out that the flash drives were extremely sensitive to the soldering iron. In fact, we killed two drives while assembling the parts for this mod. Even after meticulous soldering, perfect connections, and no short circuits whatsoever, a couple of flash drives simply died after soldering on the connector. We're not sure if it was simply from the heat or if it was an electrical discharge from the tip of the soldering iron.

If you have a couple of flash drives at your disposal and aren't concerned with sacrificing them to the fickle modding gods, feeding the necessary black, green, white, and red wires through the square cutouts in a standard USB connector makes for a clean, rigid assembly. But be prepared for the worst. After modding dozens of components, we have to say USB flash drives ended up being some of the most sensitive parts we've encountered. ▲

This project started with a standard USB thumb drive and a leftover USB case bracket that came with an old motherboard.

We began by disassembling all of the parts to expose the underlying wires and circuit board. Technically, we could have left the flash drive intact, but where's the fun in that?



tugged on the wire to make sure the joints were strong. When we were certain everything was solid, we wrapped each wire with a small piece of electrical tape for added protection, plugged the flash drive into the port, and covered the whole connector assembly with a piece of shrink tubing.

## The Grand Finale

At this point, we had a fully assembled, internally connectable flash drive, so it was time to plug it in and see if it worked. With our system powered down, we plugged the assembly into an open USB header on the motherboard and powered up the system. We saw the flash drive's activity LED light up and knew we were golden.

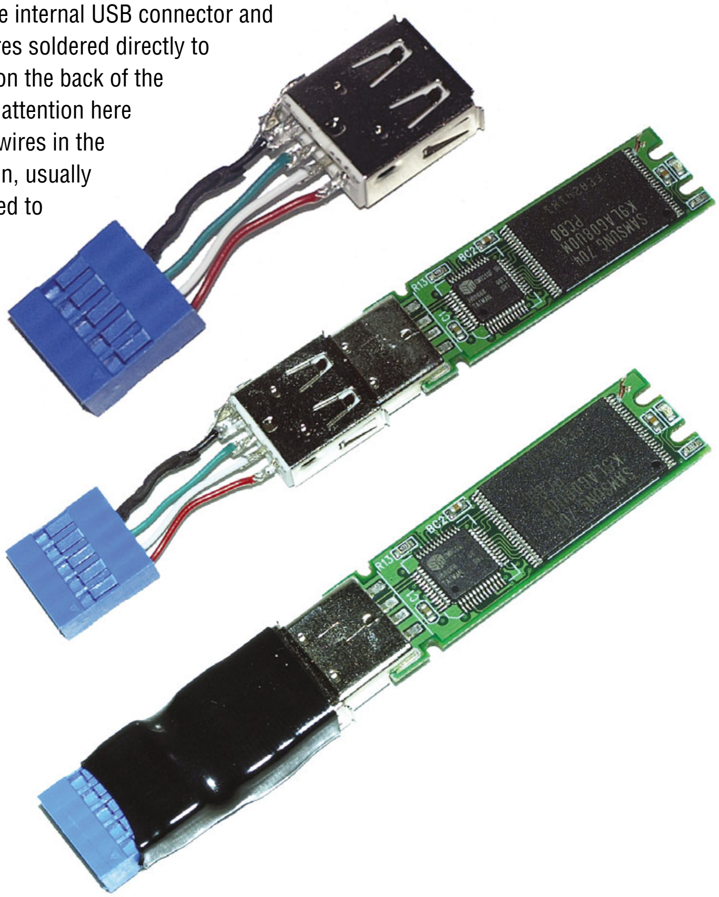
Because the drive was connected to the system before Vista booted, we weren't presented with the normal Autorun dialog box that typically pops up when you plug in an external drive; we had to manually enable ReadyBoost. To do this, we clicked the Vista Orb and then clicked Computer. In the Explorer window that opened, we right-clicked the flash drive and then clicked Properties. In the Properties dialog box, there should be a ReadyBoost tab. We clicked the tab, selected the Use This Device option, set the desired size of the cache, and clicked OK.

Our project won't make your ReadyBoost drive perform any better, but it will spice up the process of using ReadyBoost quite a bit. And since when does a modder leave anything stuck in a rig anyway? ▲

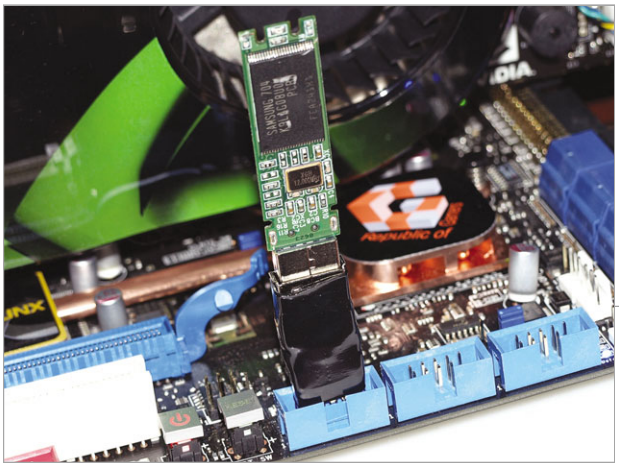
**by Marco Chiappetta**

## The Easy Way Out

If you'd like to enjoy the benefits of an internal ReadyBoost drive but don't feel like picking up a soldering iron and hacking up a couple of leftover components yourself, a few manufacturers offer internal drives in a number of different configurations. InnoDisk (www.innodisk.com) offers the aptly named ReadyBoost Drive in capacities up to 4GB, but they are difficult to attain stateside. Enthusiast memory maker Super Talent (www.supertalent.com), however, recently introduced a number of new products under its Exelerator brand that are also designed for use as internal ReadyBoost drives, although they'll function as a removable solid-state drive, as well. Super Talent Exelerator drives have capacities from 1GB to 4GB and use either vertical or horizontal connectors to accommodate various motherboard layouts and space constraints within different enclosures. (For a performance review of the Exelerator, see page 22 in the October 2007 issue of *CPU*.) ▲



We connected the internal USB connector and port via short wires soldered directly to the pins located on the back of the port. Pay special attention here and connect the wires in the correct orientation, usually ground (connected to the can), black, green, white, and red.



Once we had all of the parts pieced together and were certain our solder joints were solid, we used some electrical tape to ensure the individual wires were protected, and wrapped the entire assembly in shrink tubing.

# Mad Reader MOD

## Anatomy Of A Wicked Mod

Richard "DarthBeavis" Surroz is no stranger to dedicated, painstaking mods. In fact, his "Buffy the Vampire Slayer" mod nearly took home top honors the last time *CPU* swung into Portland, Ore., for the PDXLAN's case mod contest.

But this time, Surroz presented a case mod—if you could call it that—that could not be denied. Towering over the competition, Surroz's Autopsy (aka Mannequin Skywalker) uses a fiberglass mannequin, which Surroz purchased from an online retailer specializing in storefront equipment, as his rig's case. And the intricate customizations are far more than skin deep.

A three-month labor of love, Autopsy houses a life-sized model skeleton typically used for medical education purposes. Surroz used automotive-quality paint to give the skeleton its look. He first painted the skeleton with glossy black and then applied a clearcoat. Surroz finished the skeleton's eye-catching look with a light dusting of Alsa's Killer Chrome paint. "The paint expands and bonds to the black but doesn't completely cover it," says Surroz. "It gives the most realistic chrome look in a paint that I've seen."

Autopsy's "guts" exhibit the same level of craftsmanship as its exterior. Surroz used a quad-core Intel Q6600 overclocked to 3.1GHz with help from a Danger Den TDX cooler. The CPU and a watercooled BFG 8800 GTS 640MB sit in an Abit Fatal1ty F-190HD mobo, which rests on a custom UV blue motherboard tray from Danger Den.

"It feels great to win," says Surroz, "but I didn't enter the case mod contest to win. I just wanted to share it with my fellow modders. We have a tight community here." ▲

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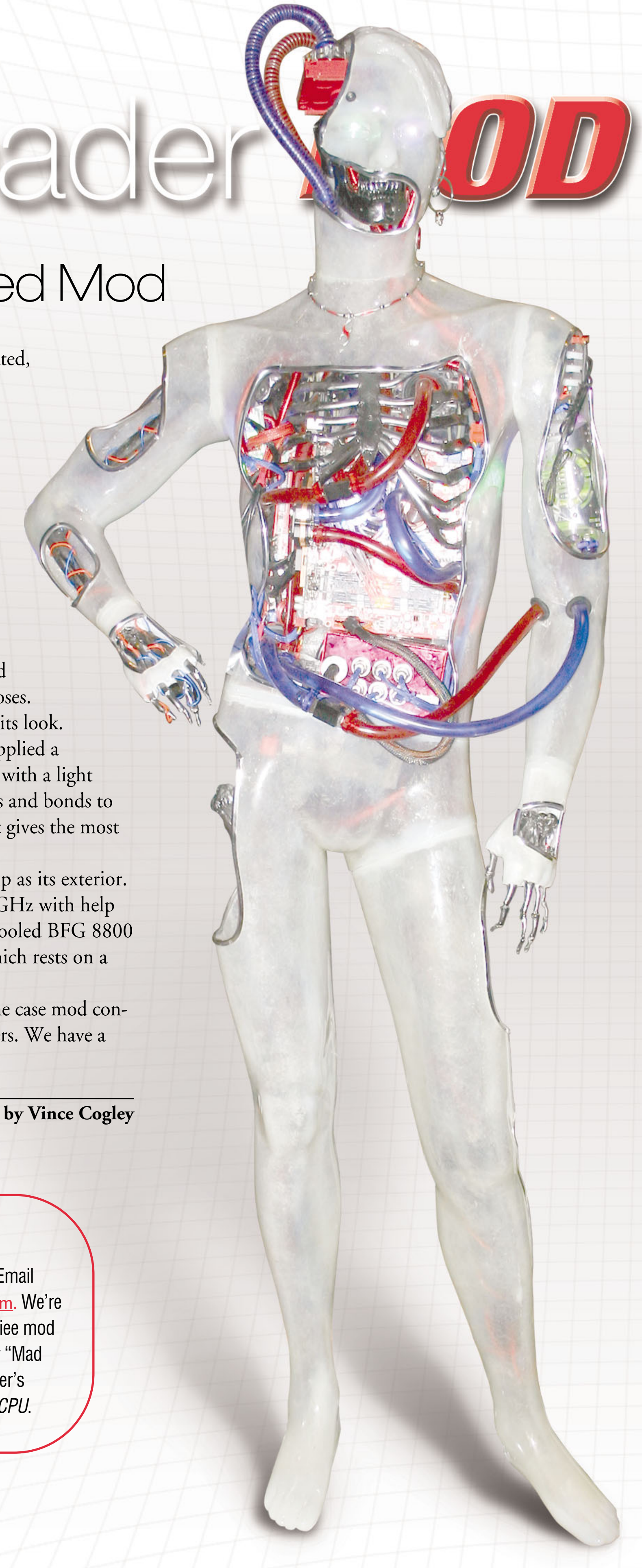
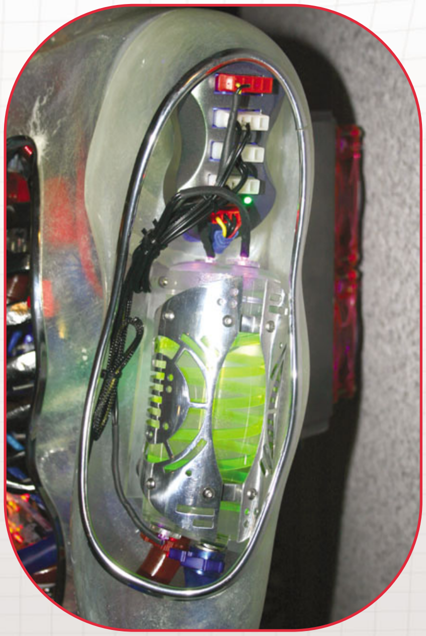
**by Vince Cogley**

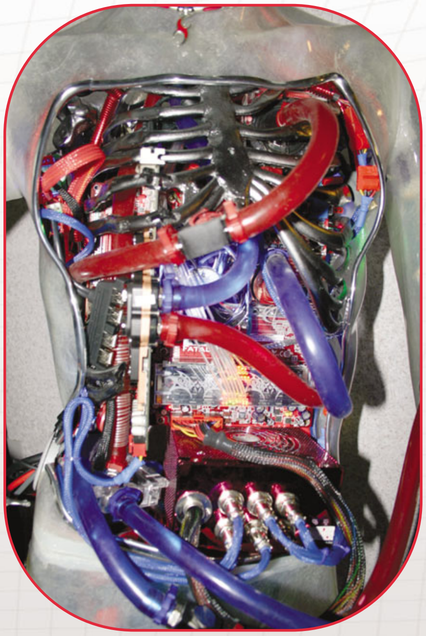


### Give Us Your Mod

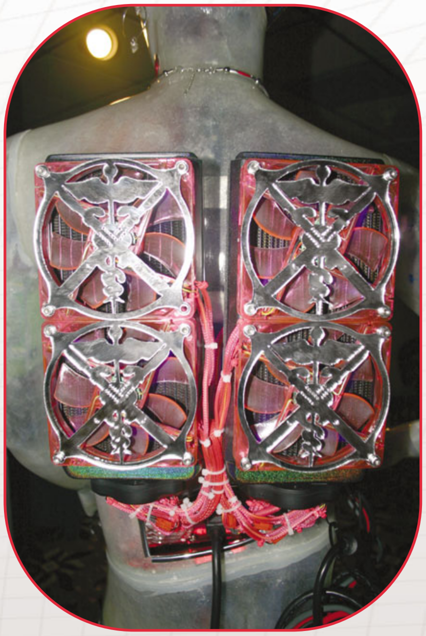
Have a computer mod that will bring tears to our eyes? Email photos and a description to madreadermod@cpumag.com. We're looking for rigs that are recognizable as PCs; your Wookiee mod won't find a home here. If we include your system in our "Mad Reader Mod" section, we'll help you load up your modder's toolbox with $1,500 and a one-year subscription to *CPU*.



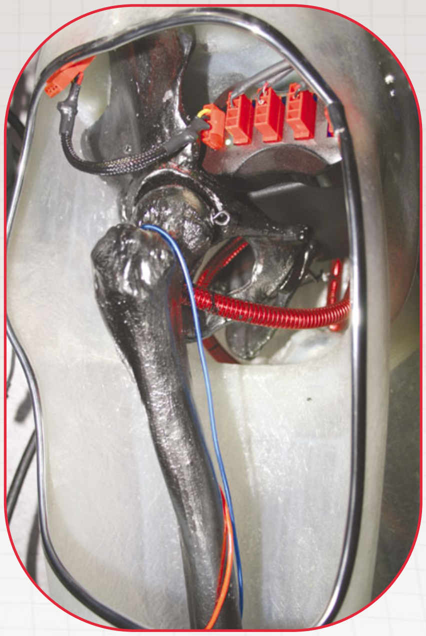
Surroz used a limited-edition reservoir from Tribal Overkill's Liquid Evolution line. The coil snaking through the radiator is a strip of UV-reactive plastic.



Kids, you won't see this in your high school anatomy class. Surroz crammed a motherboard, CPU, graphics card, PSU, and tons of cabling and hoses into Autopsy's chest cavity.

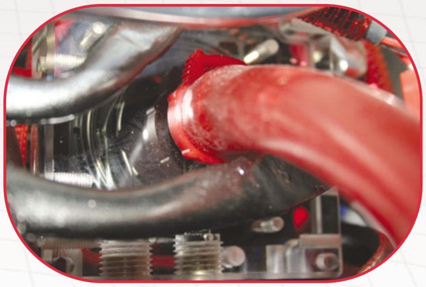


Instead of simply slapping fans on his watercooling system's radiator, Surroz commissioned Mountain Mods to fashion custom-cut caduceus grilles.

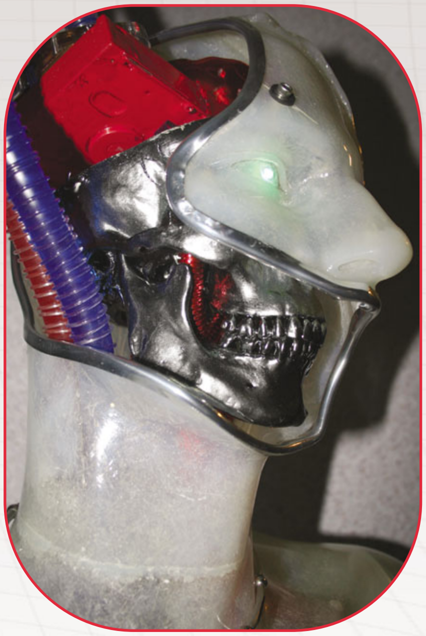


Cutting away parts of the fiberglass mannequin to reveal the skeleton was a lengthy process, Surroz says, and claimed the life of his Dremel.

Fiber optic cables originate at the Ballistix RAM LEDs, run through the chest cavity, and terminate in the brain. Any RAM activity generates a corresponding flicker of LEDs in Autopsy's brain.



Be still, my beating, er, pump. The watercooling system's pump logically doubles as the heart and also receives the LED treatment.



The hard drive sits nestled within Autopsy's brain, which Surroz built with two red acrylic mirrors sandwiched between layers of UV blue acrylic. Fiber optic cables run from the RAM to the brain, which has LEDs that fire during "cerebral" activity.

# Life Of The LAN Party

## PDXLAN Is A Power User's Playground

Piles of pizza. Miles of Ethernet cables. A dedicated support staff. A handful of popular games and airborne PSUs. This ain't your run-of-the-mill basement LAN party—not by a long shot.

PDXLAN, now with 10 successful major events under its belt, is the brainchild of Matt "Vector" Conwell. Conwell, who now plans similar LAN parties across the country for a living (some day job, huh?), originally conceived PDXLAN as part of a marketing assignment for business school at George Fox University. Eventually, PDXLAN grew from school project to full-blown LAN party. The biannual event now seats 500 attendees and has over a dozen sponsors, including Intel, BFG, and Logitech.

After having a blast at PDXLAN 9, *CPU* decided to return to the Pacific Northwest to mix business (as a sponsor, *CPU* hosted PDXLAN's case mod contest) with pleasure. (Unreal Tournament 2004 isn't going to play itself.) The sold-out event featured the aforementioned case mod contest, mouse- and PSU-chucking contests, a scavenger hunt, and, of course, plenty of official and unofficial tournaments to keep keyboards and mice humming along virtually nonstop over the four-day event.

Table Wars contestants displayed their appreciation for PDXLAN's sponsors; the team with the most spirit took home some phat loot.

### Ready, Set, LAN

Hosted at the Airport Holiday Inn in Portland, Ore., PDXLAN takes roughly 12 hours for 15 volunteers to set up. Rows of tables and chairs nearly filled the convention center, making a temporary home for attendees' computers and, in some cases, the attendees themselves. Although we didn't see too many people at PDXLAN without their own beloved rigs, corporate sponsor Intel had its alcove lined with desktops and laptops loaded with games such as Quake 4 and Command & Conquer 3. The Intel machines even offered Starcraft: Brood War for those with a touch of nostalgia.

BFG, one of the event's sponsors, had two monster systems set up for gaming, plus stacks of prizes to give away. We'll keep them in mind if we ever get around to planning CPULAN.

Only the strongest of stomachs survived PDXLAN's fudgesicle eating contest. At least the bars were Healthy Choice.

Danger Den had its hands full, between showing off its latest wares, sponsoring contests, and squeezing in as much FPS action as possible.

A pile of hapless mice were all that remained of Saturday's mouse-hurling contest, one of the many planned activities of the event.

PDXLAN's massive local network relies on Cisco's 3560G-48TS-S as its core and consists of six servers running Intel Xeon processors. In addition to hosting the event's multiplayer matches, the servers also feed patches and drivers to attendees' systems. And when the LAN goers needed a break, a giant HDTV offered additional entertainment with ample amounts of college football.

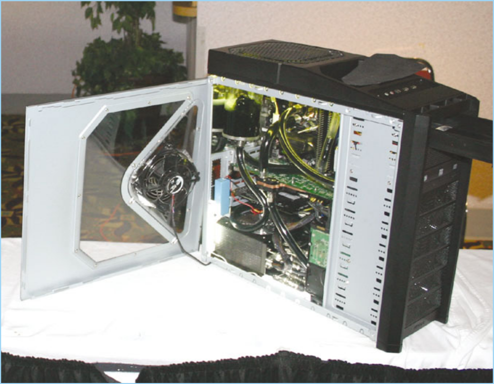
An equally impressive support staff kept the network humming along and handled the daily logistics of the event. Conwell says PDXLAN's crew, which works eight-hour shifts, consists of computer science/engineering students, IT professionals, and even a psychologist and an outdoor camp counselor. Of course, all of the volunteers are united by a common love of gaming.

"In the 'Staff vs. Attendees Challenge' we do from time to time, the staff's score is greater than the attendees," says Conwell, "so we know how to game, too."

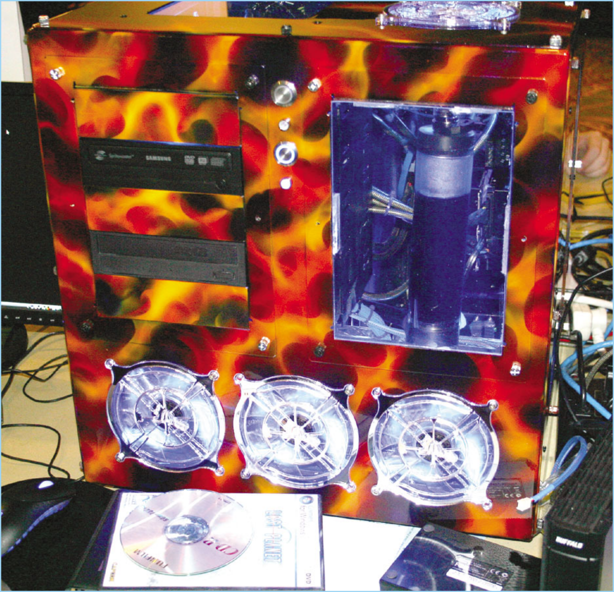
"What's very special and unique about them is that they're willing to give so much of themselves on a volunteer basis," Conwell adds.

## The Life Of A LAN Partier

For $60 (if you're among the first 400 to sign up) or $65 (if you're among the final 100 stragglers), you'll have access to a veritable gamer's buffet. In addition to 24/7 access to the LAN, attendees all receive swag bags loaded with goodies and can help themselves to all-you-can-drink Pepsi products, as well as take in the wares shown off by numerous vendors, including two tricked-out machines from BFG running the latest, most demanding titles. Antec, Foxconn, and Tagan were among some of the other sponsors at the event. Conwell estimates PDXLAN handed out over $75,000 worth of prizes (such as graphics cards, motherboards, PSUs, RAM, and several Danger Den products, including its Torture Rack).

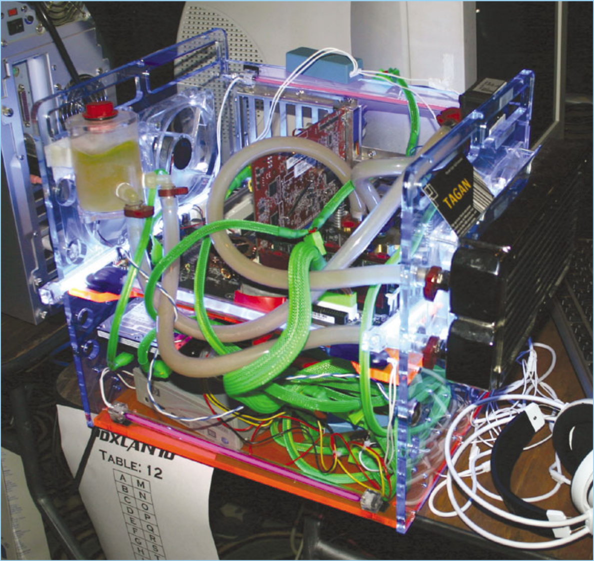


Nathan "Clam Dip" Huskey's self-titled mod crams a watercooling system and a ton of hardware in an Antec 900 case. Clam Dip features a custom-drilled hole to the T-line that "was actually a mistake that just worked out well."



John "SoundEvolution" Gibson's Fireman Box uses a Mountain Mods case and features impressive details, such as Maltese crosses etched to one of the case windows and adorning the fan grilles.

We're pretty sure that using such a high-powered system to play Web games violates a cardinal gaming law or two, but it didn't seem to bother this kid.



Wicked case mods and watercooled, overclocked rigs filled the tables and seemed the rule rather than the exception.

In addition to feasting on gaming, presentations, and giveaways, PDXLAN attendees enjoyed several other activities. The mouse- and PSU-throwing events let contestants test their strength, while eating contests let Kobayashi wannabes show off their appetites and iron stomachs. Other planned events included a giant game of musical chairs and a 200-person conga line. (Don't ask.)

"The one thing that keeps me doing LANs is . . . seeing the attendees laugh, compete, win, and just enjoy themselves," Conwell says. "As long as they keep enjoying themselves, I will gladly keep hosting LAN parties."

## If You Mod It, We Will Come

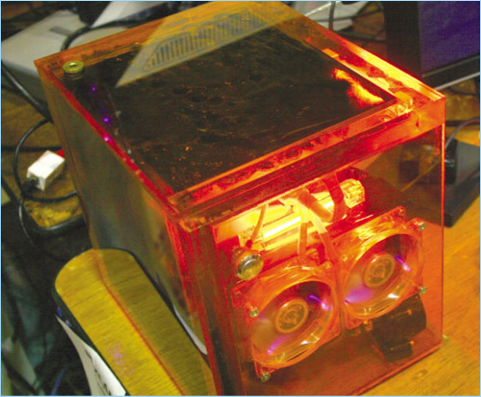
*CPU* had a blast co-sponsoring PDXLAN 9's mod contest, so we returned to scope out the latest crop of modded systems. Although the field featured several impressive entries, we ultimately settled on Richard "DarthBeavis" Surroz's Autopsy. We can best describe Autopsy as Saks-Fifth-Avenue-meets-power-computing, but you can see for yourself on the cover, or check out our two-page spread on page 46. We also liked the first aromatic mod (a watercooled system tucked inside a custom-made cedar case) we've seen and an SFF PC with a built-in waterfall, but Autopsy took the gold this time.

Surroz encourages budding modders to jump into modding. "If you can't move forward, move laterally. Always keep moving."

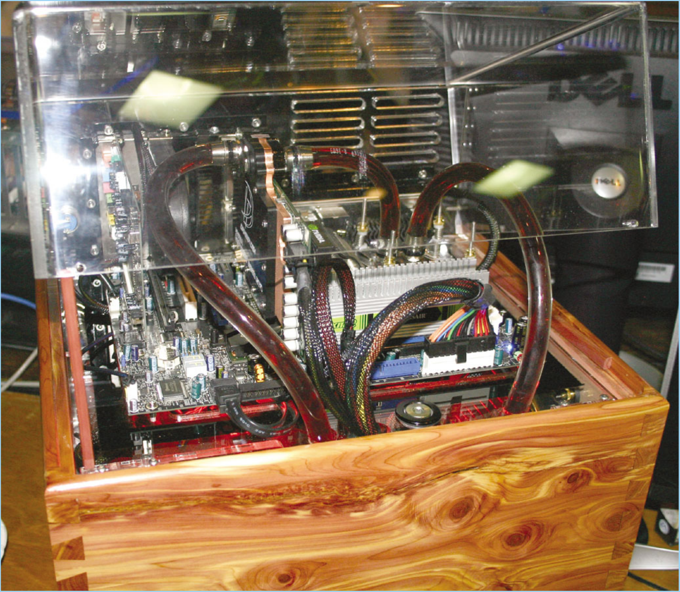
## Around The Corner

If you're in the Portland area and haven't experienced a PDXLAN, you're in luck. PDXLAN 10.5, a smaller, scaled-down version of the main event, runs from November 2 to November 4, and PDXLAN 11, the next 4-day LAN party, kicks off February 15. ▲

**by Vince Cogley**



The Lunchbox, Shaun "Chaos Server" Usher's brainchild, has a cascading waterfall that's part of his watercooling system's loop. "There's more air exposed to the water [with this design], so it actually helps with cooling," Usher says.



Cedar Chest is high-powered hardware combined with rustic charm. "Cedar's a difficult wood to work with," says Scott "Fork's Dad" Schuff. "There are several knots in it, and the grain is very figured. I wanted a wood that would stand out."

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# advanced Q&A corner

Get informed answers to your advanced technical questions from *CPU*. Send your questions along with a phone and/or fax number, so we can call you if necessary, to q&a@cpumag.com. Please include all pertinent system information.

> “ . . . if I upgrade the board and chip to a newer, dual-core processor, can you recommend a board/chip pair that is a good blend of value and performance for someone on a budget who doesn’t play computer games? ”

*Each month we dig deep into the mailbag here at* CPU *in an effort to answer your most pressing technical questions. Want some advice on your next purchase or upgrade? Have a ghost in your machine? Are BSODs making your life miserable?* CPU*’s “Advanced Q&A Corner” is here for you.*

**Mike M. asked:** I recently put together a new system, and I have a question about the voltage settings. The motherboard I used does not have a “default” or “stock” setting. It only has an Auto setting for the voltages. When I set it to Auto, it appears to be over-volting my CPU but under-volting my RAM. The motherboard is an Asus P5N32-E SLI with an Intel Core 2 Duo E6750 stepping G0 processor (max voltage 1.35V), along with a Corsair CM2X1024-8500C5D memory kit (rated at 2.2V). I am not experiencing any instability problems and have set the CPU voltage to 1.35V and the RAM to 2.2V manually, but the Nvidia MonitorView utility that’s part of nTune shows all my voltages as red (green = safe, yellow = warning, red = danger). I was curious as to how I should set the various voltages. I don’t want to fry anything. Thanks.

**A:** Don’t worry, Mike; you’re not going to fry anything with those voltages, regardless of what nTune is telling you. And the Auto setting on your motherboard is probably working fine, as well. What you have to understand is that you always have a bit of leeway with regard to system voltages. Even if you manually configure a voltage via your system BIOS, it will fluctuate up and down based on the input voltage coming from your PSU, temperature, or a number of other factors related to the tolerance of the various components used in the voltage regulation circuitry in the system. As long as you’re within 5% or so of the recommended voltage for any given component that’s being cooled properly, you’ll be fine. This is probably why you’re under the impression that your motherboard was over-volting your CPU when the voltage was set to Auto.

Your memory supposedly being under-volted is another story. According to v1.1 of the JEDEC DDR2-667/800 specification, DDR2 memory requires 1.8V (+/- 100mV) to operate. You are running DDR2-1066 memory, however, which isn’t officially part of the JEDEC specification. And to run at its rated speeds and timings, those Corsair CM2X1024-8500C5D modules require 2.2V. This disparity in the voltages is probably why nTune is flagging 2.2V as being in the “danger zone”; the utility bases its voltage recommendations not on the specific type/brand of RAM installed, but rather on the DDR2 specification. We’re not certain as to why nTune would flag 1.35V as being in the processor’s danger zone, but it is probably related to Intel’s recommended specifications, too. According to its specifications, the Core 2 E6750 requires 0.962V to 1.350V. Because you’ve manually set the voltage to the recommended maximum of 1.35V, the system probably isn't taking advantage of ESIT to dynamically adjust the CPU voltage. And because it's set to the CPU's maximum, nTune is likely flagging it as red simply because 1.35V is at the upper end of the specification. Like we said earlier, though, don't worry. We've run Core 2 E6750 processors at much higher than 1.35V and haven't had any issues yet.

**Kevin P. asked:** I'm a father of three who spends a great deal of time transferring MiniDV home videos to my computer, editing/rendering them, and burning them to DVD and MPEG-2 for sharing and archival. My most recent computer is one I built in 2003 with the following components:

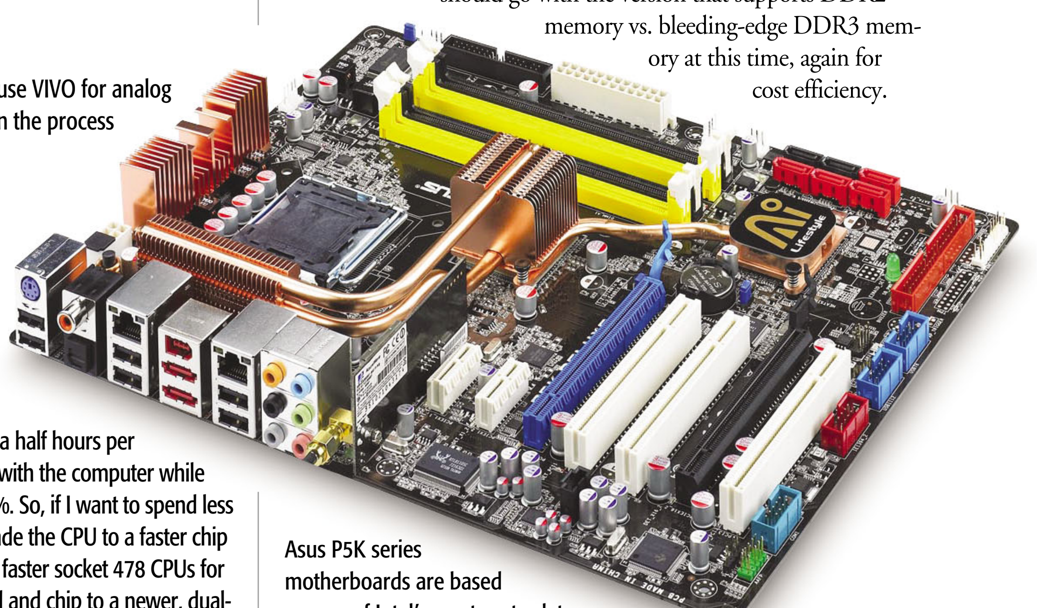
DFI PS83-BL Motherboard
Pentium 4 HT 2.4GHz, 800MHz FSB
3GB of PC3200 RAM
ATI 9200 Radeon VIVO, AGP 8X, 128MB (I use VIVO for analog capture of older home videos that I'm in the process of slowly converting to digital)
PCI FireWire card for video capture from digital video camera
PCI SATA/RAID card
Two 80GB SATA hard drives in RAID 1
Windows XP Home SP2
I've gone through many DVD burners, so I won't list them all . . .

Rendering takes upwards of two to two and a half hours per one hour of video, and I can't do anything else with the computer while this is happening, as the CPU is running at 100%. So, if I want to spend less time waiting on video rendering, should I upgrade the CPU to a faster chip or invest in a new motherboard/CPU? I've seen faster socket 478 CPUs for sale on the Internet. Also, if I upgrade the board and chip to a newer, dual-core processor, can you recommend a board/chip pair that is a good blend of value and performance for someone on a budget who doesn't play computer games? I've always owned and been partial to Intel, but I wouldn't rule out AMD if the value was better. Will my 350W PSU be enough to support a newer motherboard/CPU? If I upgrade the mobo and CPU, can I keep my AGP video card, RAM, and RAID card or will I end up having to build a completely new system?

**A:** Kevin, unfortunately or fortunately as the case may be, this is sounding a lot like a fairly significant system rebuild. Scanning through your system specs above, we'd say you could salvage your two SATA hard drives, but if you really want to cut down on your video-editing time and return some level of system responsiveness while the process is running, we'd say processor and motherboard upgrades are definitely in order.

As you noted, if your processor is pegged at 100%, you simply need more CPU throughput and resources at your disposal. Because you're partial to Intel CPUs anyway, we'll focus on that side of the fence. Depending on how multithreaded your digital video-editing software is, we like Intel's Core 2 Quad Q6600 right now, in terms of its bang-for-your-buck coefficient. With most video-editing and rendering applications, such as Sony Vegas, for example, more CPU cores cutting at the job in parallel processing will afford significant reduction in processing times and much better system responsiveness while processing. This 2.4GHz quad-core Intel processor will offer an order of magnitude more throughput over your aging 2.4GHz single-core Pentium 4 with HT. Intel's Core 2 Quad Q6600 retails for under $300 online now, but if you're more budget-constrained, we'd suggest looking at a Core 2 Duo E6400 dual-core processor, for just under $200. In either case, the new line of Core 2 Duo and Quad processors from Intel will offer significant performance gains over the P4 you have now.

As we noted, a processor upgrade will also require a motherboard and memory upgrade, as well. We'd recommend the Asus P5K series of motherboards based on Intel's new P35 chipset. However, you should go with the version that supports DDR2 memory vs. bleeding-edge DDR3 memory at this time, again for cost efficiency.



Asus P5K series motherboards are based on one of Intel's most up-to-date chipsets, the P35, and come equipped with a multitude of integrated features, including SATA RAID, FireWire, Gigabit Ethernet, and even a Wi-Fi interface on certain Deluxe models.

The good news is this motherboard has integrated SATA RAID and integrated FireWire ports. You'll also want to upgrade your PSU to something north of 400W at least. Stick to reputable brand names such as Enermax, Corsair, Thermaltake, CoolerMaster, and FSP. Finally, you'll also need to look at a new PCI Express-based graphics card, since these new boards won't support AGP. You could go with a lower-end GeForce 8600 or Radeon 2600 as you're not a gamer. However, if you really want to cut costs, the Asus P5K-VM motherboard, based on the Intel G33 chipset, has basically all the same features but with integrated graphics that will serve your purposes just fine. ▲

**by Dave Altavilla and Marco Chiappetta,**
**the experts over at HotHardware.com**

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# Intel's Super-Resolution Algorithm:

## Turning Regular Video Into HD

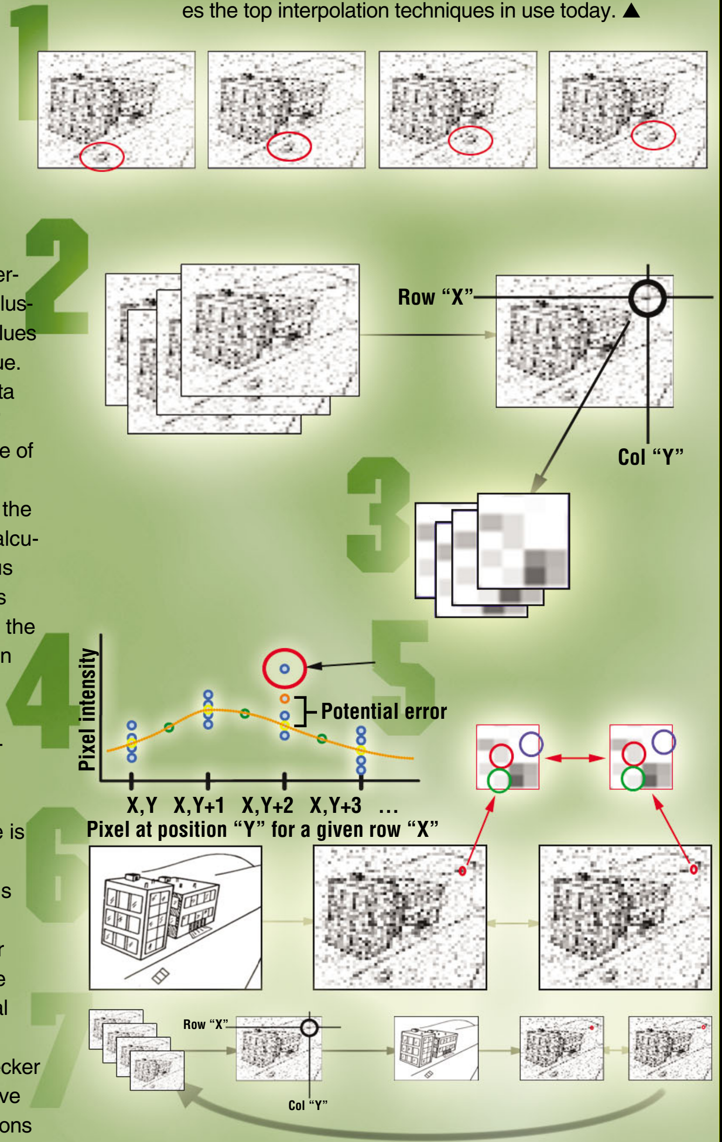
For some technologies and products, conditions must be perfect for things to work at peak efficiency. You can purchase the most expensive and feature-loaded dishwasher on the sales floor, but run hard water through it for a while, and it won't last any longer than an inexpensive model.

That's the beauty of the Super Resolution algorithm from Intel: It doesn't need perfect input video to turn low-resolution images into high-resolution images. In

## Super Resolution At Work

Using a few sequential low-resolution images and statistical analysis, the Intel Super Resolution algorithm can infer the most probable high-resolution image.

1. Intel's algorithm begins by working "backward" and determining the most probable high-resolution image. To make a "best" guess at the high-res image, the algorithm looks at a series of low-res images and finds an area/object that's moving in a predictable way. In this example, it's the vehicle.
2. The algorithm uses the predictable movement to place the moveable object in the same position on each frame and generate a composite of the first frame in the sequence (the frame from which the algorithm is trying to draw the high-res image).
3. The composite now has multiple pixel values at each pixel position, allowing it to predict the location of missing pixels needed to create the high-res image.
4. The algorithm uses the multiple pixel values to calculate the average value for the pixel that it will use in the high-res image. As illustrated by this chart, the blue dots are the actual low-res pixel values from the composite. The yellow dots represent the average value. The green dots are the additional pixels (called intermediate data points) needed for a high-res image; they follow the graph "line" created by the yellow dots, giving them the best possible chance of being correct.
5. If a blue dot (pixel value) is statistically too far out of line with the other samples, the algorithm will eliminate that value when calculating the average. As you can see from the orange dot versus the yellow dot in the X,Y+2 column, such statistical anomalies could greatly throw off the graph. (The orange dot represents the average if the blue dot with the statistical error was included in the average; the yellow dot represents the average when the blue dot with the statistical error is eliminated.)
6. After making this first "guess" at the high-res image, the algorithm then degrades its high-res image "guess" into a low-res image and compares it to the existing low-res images in the sequence, determining the probability that the high-res image is as correct as possible.
   "With more information, you can refine your estimation," Intel's Haussecker says.
7. The iterative loop begins again, as the algorithm makes another guess at the high-res image, degrades it, and compares it to the actual low-res image. Once the algorithm decides that additional iterative loops won't yield improved results, it halts the loop and uses the final calculations to create the high-res image. Haussecker says, on average, about 10 iterative loops are required to achieve the best possible high-res image, although the number of iterations can be preset at a lower number if time for performing the calculations is limited. If the algorithm simply doesn't have enough data from the low-res images to calculate the high-res image as accurately as it should, the algorithm defaults to the first "guess," which means it matches the top interpolation techniques in use today. ▲


1
2
Row "X"
Col "Y"
3
4
5
Pixel intensity
Potential error
X,Y X,Y+1 X,Y+2 X,Y+3 ...
Pixel at position "Y" for a given row "X"
6
7
Row "X"
Col "Y"

Source: Intel

fact, the Super Resolution algorithm often works better when the input video is a little jumpy from camera shake.

"It turns a problem into an advantage," says Horst Haussecker, principal engineer for the Super Resolution algorithm. "If you have the perfectly same information in every frame, the algorithm gets the same data over and over. If the sample data (in each frame) is slightly different, then you have more information to make the HD video."

## Tera-Scale Computing

Intel's research into its Super Resolution algorithm grew out of the company's Tera-Scale Computing Research Program, where Intel researchers are developing technologies and software packages that can take advantage of microprocessors with massively multiple cores and tera-scale computing power. Within five to 10 years, it's possible that desktop computers will contain processors with several dozen cores, and consumers will want applications that can take advantage of that type of computing power.

Using the Super Resolution algorithm to convert SD (standard-definition) video into HD video in real time is a task that will require multiple cores to perform; Intel has estimated it could require up to 150 cores. The algorithm assigns individual regions of the video to individual cores, which makes the algorithm scalable. With low-resolution video, Intel has demonstrated the algorithm on a dual-core processor, converting QVGA video to VGA video. As the hardware and the number of cores improve, the algorithm will be able to handle videos with more resolution in real time, eventually converting DVD video to HD DVD video.

"Standard definition to high definition is beyond the capabilities of the available hardware today," says Jerry Bautista, co-director of the Tera-Scale Computing Research Program. "But video quality as is on YouTube could be done virtually on the fly today. Ultimately, we expect people to want to go to the full gamut when the hardware is available. But it's important to show that Super Resolution is applicable today on today's hardware."

Scalability is a very important aspect of the Super Resolution algorithm.

"We can process low-res video now, and it moves along pretty nicely," Bautista says. "For our own people to see this running on today's platforms is very good. There's not a need to reconfigure the fundamental algorithm. It's scalable. It can grow as the computing capability grows."

Haussecker says research on the Super Resolution algorithm began about five years ago as engineers and researchers inside Intel were looking for ways to enhance video from manufacturing processes inside the company.

"We were building such small structures that even electron microscopes couldn't keep up," Haussecker says, and Intel researchers developed the Super Resolution algorithm to enhance video from the electron microscopes. "At some point, we decided it might be interesting to look at applying this technology to consumer video."

## Fixing Mistakes

As digital video cameras increase in resolution while decreasing in body size, manufacturers must use a smaller image sensor with smaller individual pixels, which leads to more noise and grainy video when lighting conditions aren't great.

"That's not really a problem with low resolution, but it's a problem of light sensitivity," Haussecker says of the noise in some videos. With the Super Resolution algorithm, "the noise artifacts get removed, too. Noisy pixels are nonconsistent, so they get thrown away."

The Super Resolution algorithm can fix problems with shaky video and with missing frames, too.

"We can insert two new frames between each frame," Bautista says. "It's smooth with the added frames. . . . It's good for jittery video. It's good for frame-rate conversion. And it's all based on the same algorithm."

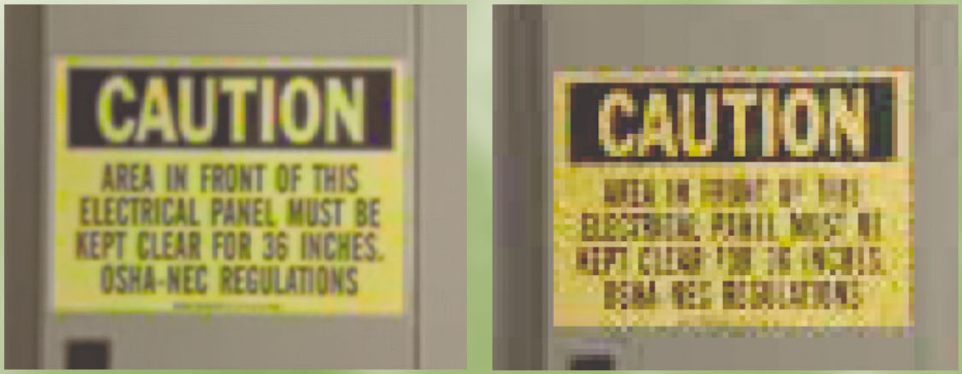
With the capabilities built into the Super Resolution algorithm, the days of shooting poor-quality video on your camcorder or with your cell phone eventually will come to an end. The Super Resolution algorithm can compensate for mistakes on the user's end or on the video camera's end.

However, there still will be one unforgivable mistake when taking video: You won't be able to leave the lens cap on the camera. As great as the technology's potential is, the Super Resolution algorithm can't even fix that problem . . . yet. ▲

**by Kyle Schurman**

## Sharp Photos, Too

The Super Resolution algorithm works with still photographs as well as video, creating the sharp image of the sign on the left from the low-res image of the sign on the right. However, to create the high-res still image, the algorithm would need several low-res images, and those images would all need to be slightly different. The algorithm works best with low-res images that are slightly different because that gives the algorithm more data with which to create the high-res image. ▲



*Source: Intel*

# Microsoft Surface

## The Future Of Computing Is Touchy-Feely

*“We used to say, ‘A computer on every desktop.’ Now we say, ‘Every desktop will be a computer.’”*

With that minor tweak in corporate focus, this summer, Bill Gates introduced Microsoft’s newest aim: surface computing. Microsoft is hoping the idea of surface computing—where the mouse and keyboard disappear, replaced by more natural hand gestures on a large display screen where multiple users can interact simultaneously—will make computing and technology easier to use.

Surface computing’s versatility and collaborative nature has led Microsoft CEO Steve Ballmer to say the idea of surface computing could eventually be a multibillion-dollar industry. (For this story, *Surface,* when capitalized and alone, will refer to the Microsoft product. When we use *surface computing* in lowercase, it will be describing the generic method and idea of surface computing.)

“We’re trying to make computing more approachable,” says Mark Bolger, senior director of marketing for Microsoft Surface Computing.

### The Definition

The terminology involved with this Microsoft project might be a little confusing at first. Surface computing can be used as the general name for the branch of computing where users employ a touchscreen-like environment to interact

## Putting Surface To Work

Do you often lose your television remotes? Surface can replace them, making a virtual remote always available on the display screen.

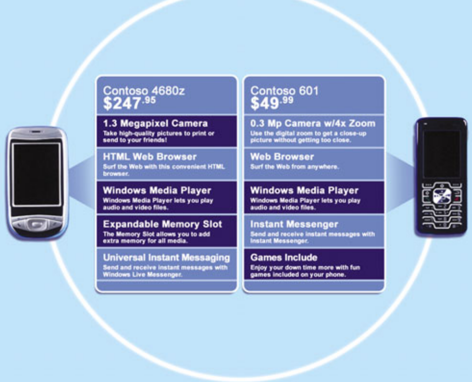
Tired of your kids finger-painting on the furniture? (Inadvertently, of course . . . at least, that’s what they tell you.) Surface can let them "paint" without paint on the display screen.

Bored at the restaurant waiting for your meal? Surface can let you play a virtual board game or use the Web directly on your tabletop.

The number of ways you will be able to use Surface is pretty amazing, including the ability to have multiple users working with Surface at one time.

Although we've listed only a few potential “big-picture” uses here, the bottom line is this: The list of ways you could put Surface to work is extremely long. And the list is only beginning . . . after all, this is only "Version 1" of Surface.

“I can guarantee we’ll be adding more features,” says Microsoft’s Keam. ▲



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| **Universal Instant Messaging** Send and receive instant messages with Windows Live Messenger. | **Games Include** Enjoy your down time more with fun games included on your phone. |

**Cell phone.** Walk into a T-Mobile store with a Surface unit installed, and you might be able to perform several cool functions, including comparing two cell phone models simply by setting the phones onto the Surface tabletop. Surface then will display the key features and specifications for each model. With some models, you might be able to place your phone on the Surface tabletop and change some of your account and phone settings or add ringtones.

**Photos.** Making use of a Wi-Fi connection, Surface can download photos from some digital cameras. The photos appear to “spill” out of the camera and onto the tabletop, just as if they were prints. You can resize the photos or order prints, all by using hand gestures. Users then can drag the photos to other areas or objects (such as a cell phone) laying on the screen, sharing them with other people. You also can burn a DVD or turn the photo into a postcard, all from the Surface tabletop.

Source: Microsoft

with the computer without a keyboard and with no mouse. Multiple users should be able to simultaneously use a surface computer, too. You might also see surface computing used as the term for the brand name for Microsoft's surface computing product, called Surface, which is a tabletop device that stands almost 2 feet high.

Bolger says Microsoft has three goals with surface computing: to remove the intimidation factor often found with technology, to remove the isolation factor with most types of computing, and to make computing more convenient.

"Many technology products are designed for one person, such as an MP3 player with headphones," Bolger says. "Surface is a 360-degree user interface, allowing people to collaborate on projects."

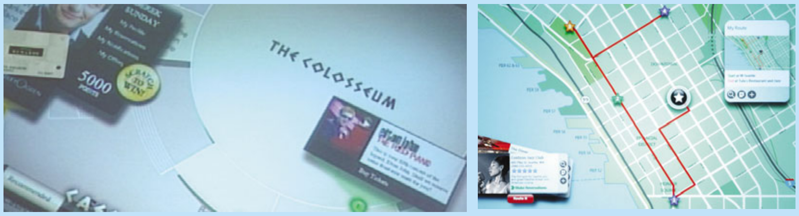
## The Technology

Surface's software platform includes an interface that exists on top of Microsoft Windows Vista Business and allows users to interact with the unit. Even though Vista is part of Surface, you won't see the Start button or other traditional hallmarks of the Windows operating system when using Surface.

Surface makes use of five cameras mounted beneath the table's surface. The cameras "look" at the surface of the tabletop, determining when objects or a user's fingers are touching the surface. The cameras then send their data to a computer inside the Surface unit, which performs the calculations and draws the display. A DLP projector displays the results on the table screen from underneath, allowing the images to be viewed from any angle from above. Making the DLP projector work properly was difficult, says Nigel Keam, architect for Microsoft Surface Computing, in part because the projector must be within about 21 inches of the screen.

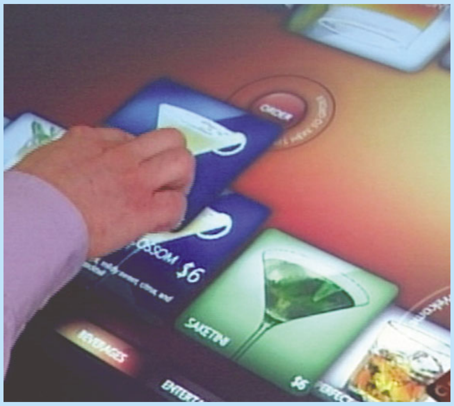
To run the computer inside Surface, Microsoft used off-the-shelf components, including a 3GHz Pentium 4 microprocessor. Surface makes use of an extremely powerful GPU, and it uses the GPU to perform most of the calculations required to translate the data from the cameras into useable information for the computer and display. Keam says the GPU was a better choice than the CPU for performing the necessary calculations because of its powerful capabilities.

"You have a lot of information coming at a high speed," Keam says. "There's 27 megapixels per second per camera. That's

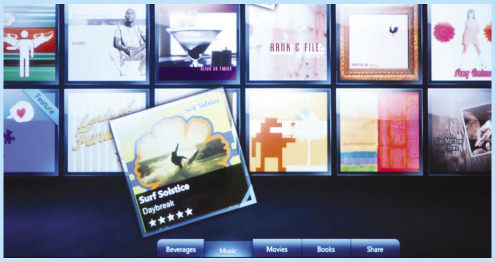


**Mapping.** Using Surface, you can select and drag an item from a list of events to your "Itinerary" area. With your itinerary set, you can then tell Surface to draw a map, showing the preferred route and timeline for each event. You also could purchase tickets for a show directly through Surface by dragging the virtual ticket onto your credit card as it lays on the Surface tabletop. (*NOTE: Because of continued development of security safeguards in Surface, version 1 of the product probably will not contain the credit card feature.*)

**Paint.** To "paint" without paint, simply open the Paint software that's part of Surface. You then can use your fingers, a paintbrush, or other tool on the Surface tabletop. As long as the tool makes contact with the tabletop, "paint" is displayed on the screen. Surface uses its multiple cameras to determine whether the tool is making contact, rather than a touch-sensitive screen.



**Restaurant.** Scroll through a virtual menu on the Surface tabletop, finding the drinks or food you want. You can find a description of the product and a price by pressing an Info button. Once you make a decision, simply use your finger to drag the image of the drink or entrée onto the Order button. Surface also may be able to recognize the type of wine you've purchased (by reading a domino tag affixed to the glass) and recommend entrees that will complement the wine.



**Music.** You could use Surface as a personal jukebox, selecting from many different albums and songs. With the right MP3 player, you also could purchase songs and drag them onto the MP3 player using the Surface tabletop.

quite a lot of data to go through, so we do most of the processing work on the GPU. [The idea of using the GPU for processing tasks] was kind of new when we started using it in early 2004."

Unlike what you might think after a first glance at Surface, the technology does not make use of a touch-sensitive screen. Instead, the product uses five cameras mounted beneath the table's surface. The cameras determine when someone touches the Surface table, and the unit's software then reacts accordingly. The Surface system can simultaneously handle 52 points of contact. Some people refer to Surface as using a "touch interface."

"Ironically, given the name of the product, the point where [the technology] gets the most difficult is at the surface," Keam says. "From the optics side, you need a strong diffuser to splash the light around so you can see it from every angle."

Surface's software can recognize objects using two methods: reading a domino-style ID tag attached to the object or recognizing the shape of an object.

Keam calls this first version of the domino tags "low-resolution" tags, because they contain only 8 bits of data. The tags measure 0.75 inches square. He says domino tags used in the future will contain more data, making them "high-resolution" tags.

Developers looking to write applications for Surface can work in WPF (Windows Presentation Foundation). Keam says developing apps for Surface is a lot like developing apps for Vista, but WPF is needed to deal with Surface's unique interface. Keam says one of the more challenging aspects of writing applications for Surface is dealing with the fact that there is no "up" or "top," as there is on a traditional computer screen, because users can be sitting at any angle around the Surface tabletop. What appears normal to a person on one side of the tabletop would be upside down to her partner sitting across the table, and developers must account for the varying orientations of users.

## The Plan

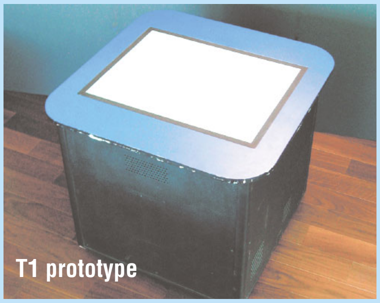
Keam says that although there were plenty of challenges in the technological aspect of making Surface work, making the business side of Surface work wasn't easy, either.

"It was such a rich, new format, we had a real question as to where to start: the military, government, schools, businesses," Keam says. "It took a while to crystallize."

Microsoft eventually settled on working with partner companies to deploy the first version of Surface units. Harrah's Entertainment, T-Mobile, Sheraton Hotels and Resorts, and IGT will receive the first Surface units, employing them for public use. Microsoft is offering its partners Surface units for $5,000 to $10,000 per unit. Each partner will use Surface for different purposes. Sheraton, for example, expects to use Surface units in the lobbies of its properties, allowing guests to obtain information or to use the unit for entertainment purposes. Harrah's might allow

## Surface Timeline

For many people, an introduction to the idea of surface computing probably arrived with the 2002 movie "Minority Report," where police easily manipulated data and images with their hands on a vertical glass screen. But even before that movie hit theaters, Microsoft had begun developing Surface, hoping to improve the way people interact with computers and technology. And Microsoft isn't the only group that's been working on surface computing concepts in recent years.


T1 prototype

**2001.** Microsoft's Steve Bathiche (hardware division) and Andy Wilson (research division) began developing an interactive table that could determine the type and location of physical objects. The initial project, given a code-name of Milan, focused on providing an interactive gaming experience.

**2003.** Microsoft created the first prototype of Surface (called T1), cutting a hole in an IKEA table and using a sheet of architect vellum as the diffuser. Early applications included a pinball game, photo browser, and a video puzzle. But applications quickly grew beyond gaming and toward ideas where the application takes advantage of the T1's ability to recognize physical objects on its surface.

**2004.** With development of Surface's platform near completion in 2004, the Microsoft development team began working on the physical appearance of Surface, coming up with 85 prototypes.

Surface final product

**2005.** Microsoft's development team settled on the same physical design for Surface that appears today, including a 30-inch display (measured diagonally). The console measures about 22 inches in height, 21 inches in depth, and 42 inches in width.

**2006.** Jefferson "Jeff" Y. Han, a research scientist at NYU's Courant Institute of Mathematical Sciences, demonstrates a computer screen that's similar to a touchscreen interface but that can recognize multiple contact points at one time. Some industry analysts compare Surface to Han's development. (Han has since formed a company, called Perceptive Pixel, to commercialize the technology.)

**2007.** Surface appears as a product for the first time. Microsoft's partners for Surface include Harrah's Entertainment, IGT (International Game Technology), Sheraton Hotels and Resorts, and T-Mobile, and those companies should have Surface units in use in the winter of 2007. ▲

Source: Microsoft

customers to use the units for beverage and food ordering or as a virtual concierge desk. IGT expects to create games for casinos using Surface, although any gambling games developed for Surface would need regulatory approval.

At its current price, Surface probably isn't practical for consumers to use in their homes, and Microsoft isn't going to sell the units to consumers at this point. But the ideas and technologies used in Surface eventually should appear in products aimed at home users.

With Surface, Bolger says Microsoft is following the successful rollout model seen most recently with big-screen HDTVs. When the large-screen LCD and plasma models initially appeared, they cost $10,000 or more and mainly appeared in entertainment venues.

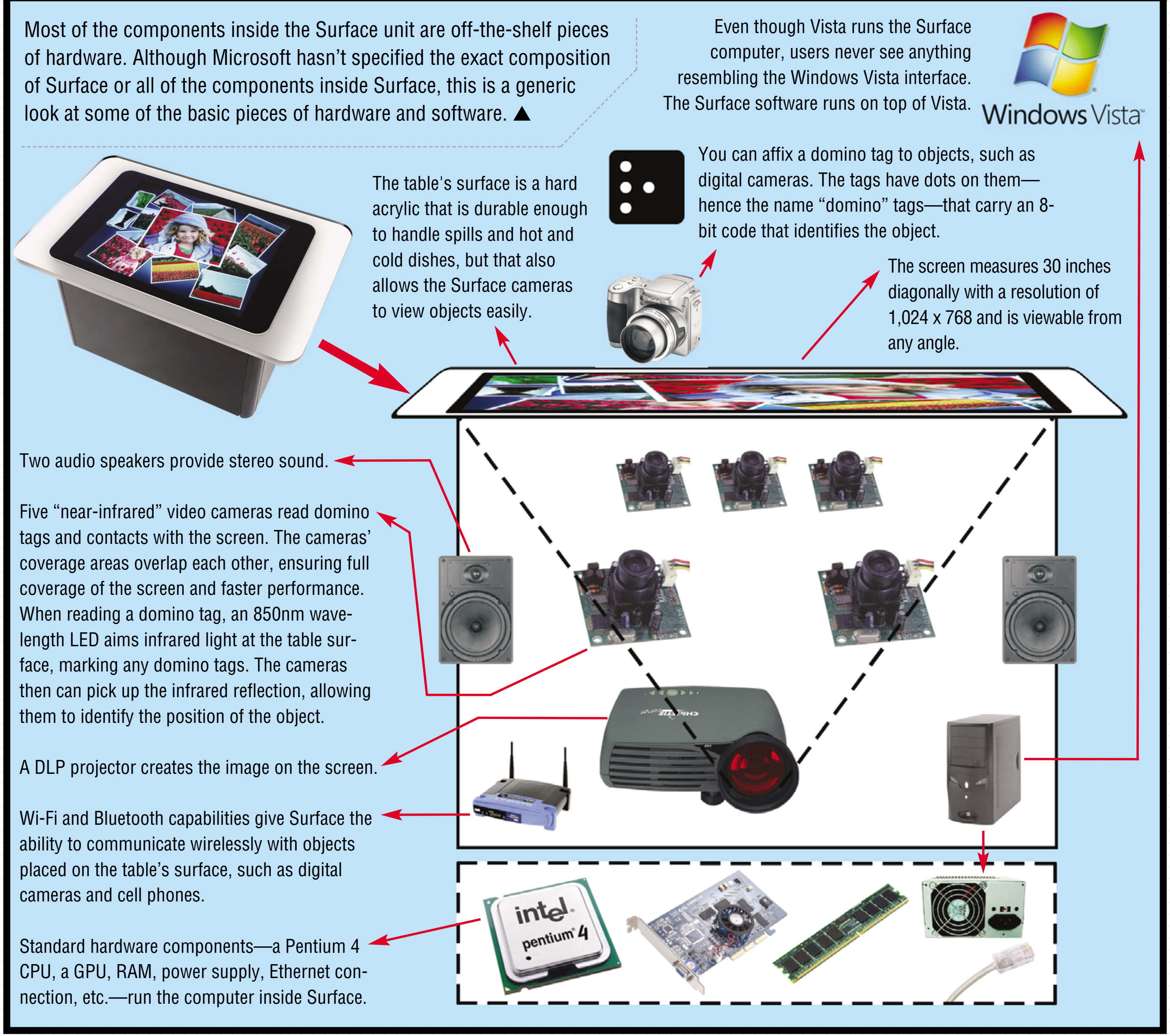
“They branched out from there, and the price point dropped,” he says. Now, three to five years later, many consumers own big-screen HDTVs. Microsoft is hoping Surface enjoys a similar marketing journey.

What Surface will look like in the future isn't known at this point. You could see Surface-type technologies built into your countertop at home or into the door of your refrigerator. Keam and Bolger wouldn't say what features and applications will appear in Surface in the future, but they say Microsoft will continue adding features.

“This is only Chapter 1 of a very long book of surface computing,” Bolger says. “In three to five years, the form factor will change, and the price point will drop. . . . We're redefining how people interact with digital information. We're taking an ordinary tabletop and turning it into a vibrant surface. We're taking computing to places it hasn't been able to go.” ▲

**by Kyle Schurman**

## Inside Surface



Most of the components inside the Surface unit are off-the-shelf pieces of hardware. Although Microsoft hasn't specified the exact composition of Surface or all of the components inside Surface, this is a generic look at some of the basic pieces of hardware and software. ▲

Even though Vista runs the Surface computer, users never see anything resembling the Windows Vista interface. The Surface software runs on top of Vista.

The table's surface is a hard acrylic that is durable enough to handle spills and hot and cold dishes, but that also allows the Surface cameras to view objects easily.

You can affix a domino tag to objects, such as digital cameras. The tags have dots on them—hence the name “domino” tags—that carry an 8-bit code that identifies the object.

The screen measures 30 inches diagonally with a resolution of 1,024 x 768 and is viewable from any angle.

Two audio speakers provide stereo sound.

Five “near-infrared” video cameras read domino tags and contacts with the screen. The cameras' coverage areas overlap each other, ensuring full coverage of the screen and faster performance. When reading a domino tag, an 850nm wavelength LED aims infrared light at the table surface, marking any domino tags. The cameras then can pick up the infrared reflection, allowing them to identify the position of the object.

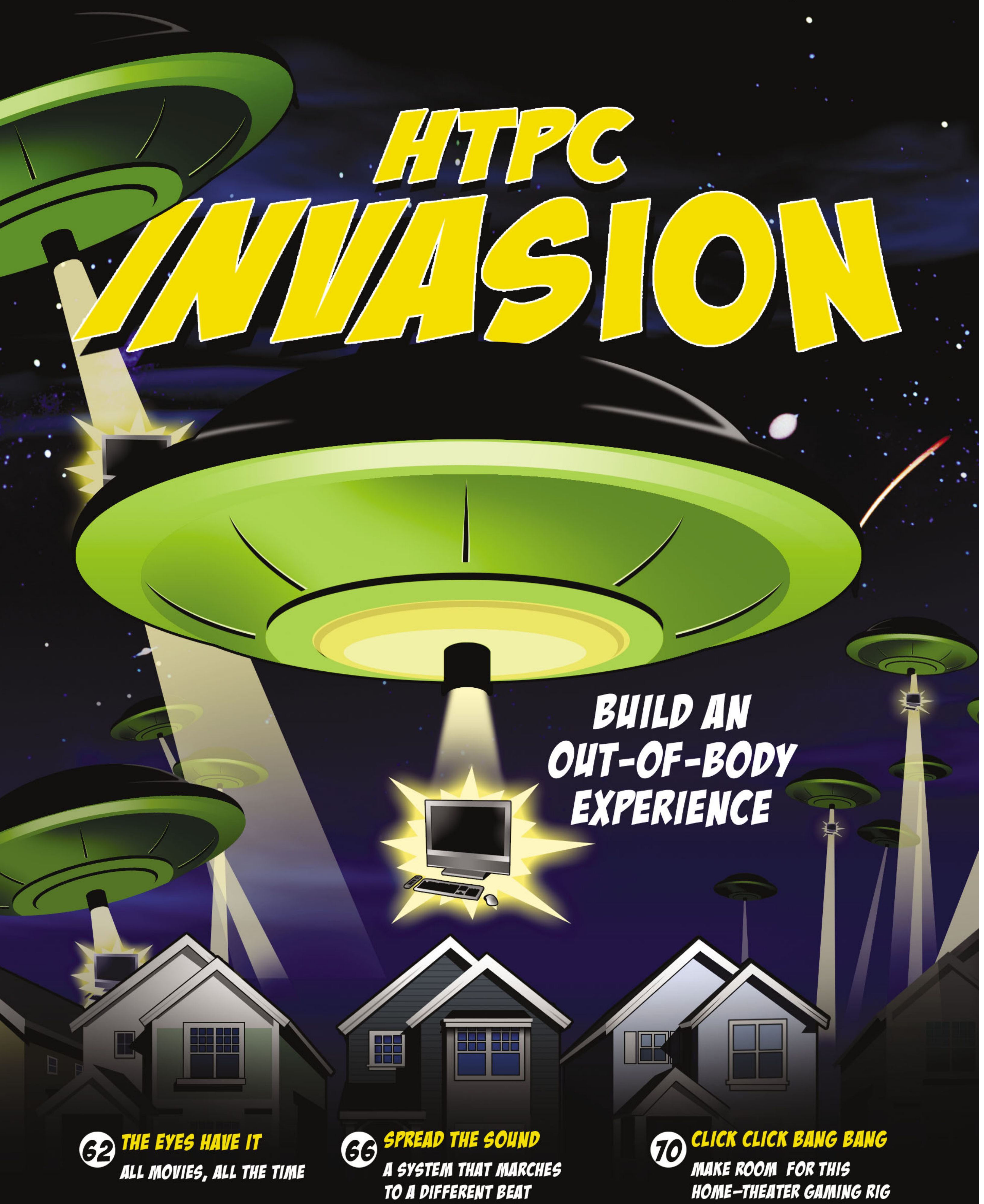
A DLP projector creates the image on the screen.

Wi-Fi and Bluetooth capabilities give Surface the ability to communicate wirelessly with objects placed on the table's surface, such as digital cameras and cell phones.

Standard hardware components—a Pentium 4 CPU, a GPU, RAM, power supply, Ethernet connection, etc.—run the computer inside Surface.

Source: Microsoft

# HTPC INVASION



## BUILD AN OUT-OF-BODY EXPERIENCE

62 **THE EYES HAVE IT**
ALL MOVIES, ALL THE TIME

66 **SPREAD THE SOUND**
A SYSTEM THAT MARCHES TO A DIFFERENT BEAT

70 **CLICK CLICK BANG BANG**
MAKE ROOM FOR THIS HOME-THEATER GAMING RIG

If you think back to your first home-theater PC, it was probably a lot more PC than home theater. We remember shaking with excitement as we slipped a DVD-ROM drive into our system, giving it the impressive ability to play DVDs. We turned to Winamp to funnel our "massive" 2GB collection of music through our PC speakers. The thrill came not from having the pinnacle of A/V experiences but rather having an A/V experience on a computer at all.

Chapter-skip ahead to 2007. Home theater purists still prefer components dedicated to one role: making movies pop and music roar. But HTPCs have evolved beyond an entertainment center eyesore—appealing to only the geek elite—to a hub for the everyman's digital media. And you know the concept is legitimate when Microsoft brews a special flavor of Windows XP to meet the growing demand for a PC as capable in the family room as it is in the office. (Sorry, Apple, but your little "iTunes for your TV" box doesn't quite count.) Welcome to the big time, HTPC. You've gone from niche market to mainstream success. If you started out as an indie film, you're on the cusp of becoming a summer blockbuster.

You can build an HTPC that can do it all (and we've built a rig to do so in "The Swiss Army HTPC" on page 74), but do you really need to? Like any PC, we can fine-tune these rigs, customizing them to fit our needs. Desire the pinnacle of visual stimulation? You need a BD or HD DVD drive (or both if you have the cash to spare). Crave the sounds of violins singing and timpani roaring? You must have a capable set of speakers. Lust for a gaming console to rival today's next-gen machines? You obviously need to figure out how that GeForce 8800 GTX will fit in your case *and* keep quiet amidst other silent components in your A/V rack.

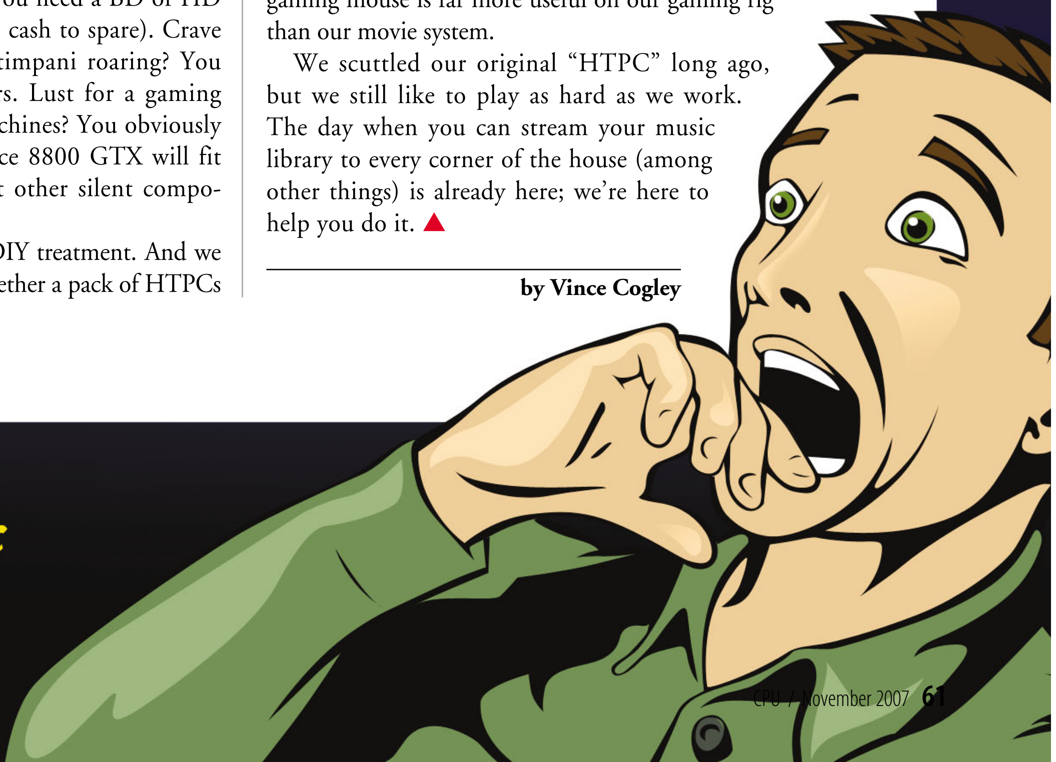
In this issue, HTPCs receive the DIY treatment. And we didn't stop at one system. We put together a pack of HTPCs tailor-made for different breeds of entertainment enthusiasts. For example, there are plenty of digital music lovers who wish to enjoy their music unencumbered by DRM. We went one step further with our audio box, going completely open-source with Ubuntu Linux to give ourselves complete mastery over our music. (See "Spread The Sound" on page 66.) On the other hand, Linux surely wouldn't do for a gaming HTPC. In "Click Click Bang Bang" (see page 70), we tackle the challenge associated with installing a high-end graphics card in an HTPC case. Movie buffs will want to check out our HTPC that's geared toward scintillating cinema, starting on page 62. Note that we listed the MSRP for each component we picked and went with the lowest online price we could find when an MSRP wasn't available.

We've also taken a slew of photos to give you an illustrated guide on assembling each system. Although much of the build process is the same as constructing a traditional desktop PC, these cases aren't your garden variety ATX. We documented the ins and outs of each build, providing visual help for important steps.

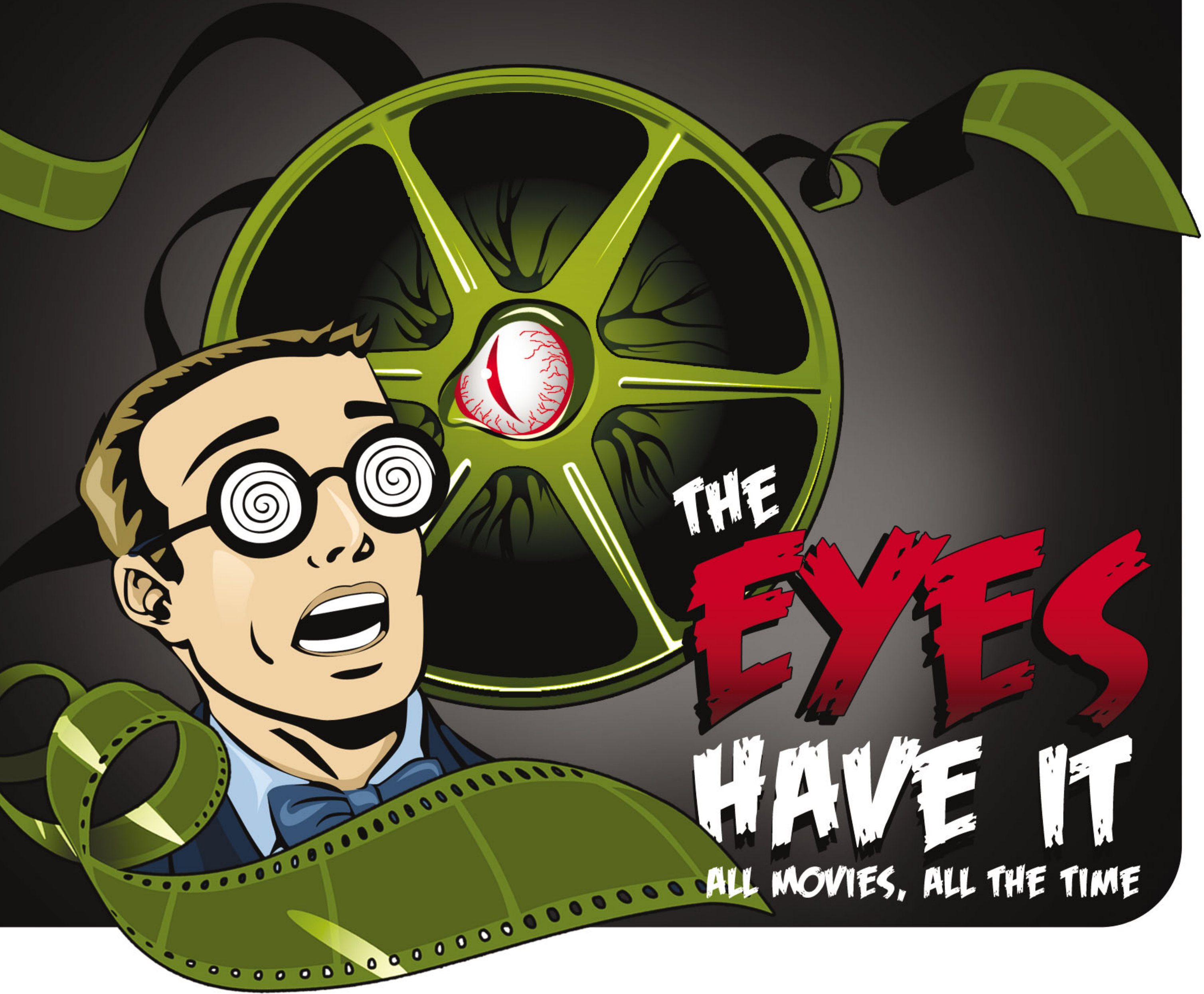
Picking the right software and accessories is just as important as selecting the right hardware. Music management and DVR software, while optional on grandma's email/Web-surfing PC, are mandatory on true HTPCs. Even the operating system plays a crucial role in what your HTPC can and can't do. Vista's built-in Media Center software is certainly able to wear many hats, but Vista itself balks at DX9 games. (And there's still plenty of life left in DX9.) And while we're on the subject of games, that G7 gaming mouse is far more useful on our gaming rig than our movie system.

We scuttled our original "HTPC" long ago, but we still like to play as hard as we work. The day when you can stream your music library to every corner of the house (among other things) is already here; we're here to help you do it. ▲

**by Vince Cogley**



74 THE SWISS ARMY HTPC
YOUR HTPC CAN BE YOUR EVERYTHING PC



# THE EYES HAVE IT

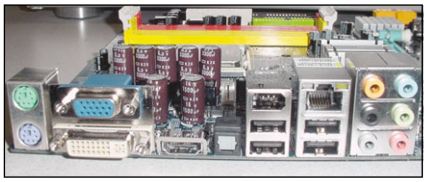
## ALL MOVIES, ALL THE TIME

Achtung, videophiles! Our goal for this HTPC is to play back, stream, record, and store any video source—HD or otherwise—that you can throw at it. We also want the machine to be more than capable at typical HTPC tasks, as well as common PC-related tasks, such as light gaming, PVR functions, Internet browsing, document creation, media storage, and integration with a network.

The aesthetics of this videocentric HTPC are also a priority: It mustn't look out of place when seated beside your other home-theater components. Lastly, it must be ultra-quiet, using as many passively-cooled components as possible and quiet 120mm fans where active cooling is compulsory.

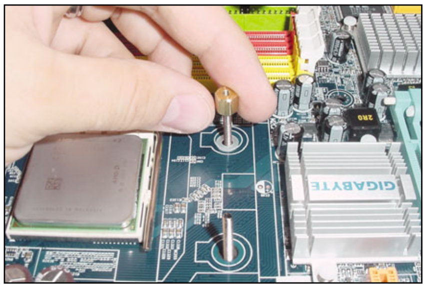
### Picking Parts

For this HTPC, we made the case one of the primary components. Lian Li's PC-C31 ($139.99; www.lian-li.com) comes in a brushed aluminum finish available in black or silver. The case supports Micro ATX motherboards, two external 5.25-inch drives, and features two whisper-quiet 120mm case fans.



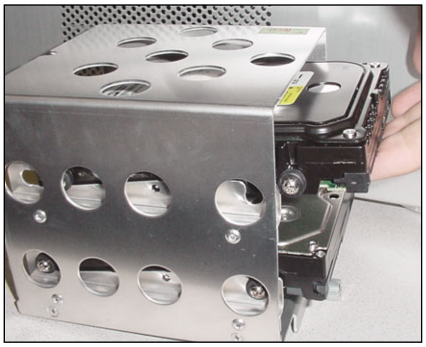
The back I/O panel on Gigabyte's GA-MA69GM-S2H is an HTPC-builder's dream.

For our motherboard, we found an exceptionally appealing platform in AMD's 690G chipset, which supports an HDMI port and has onboard HDCP keys. AMD's recent BIOS refresh also adds some nice overclocking features. We settled on Gigabyte's GA-MA69GM-S2H ($79.99; www.gigabyte-usa.com), which supports Socket AM2 processors, four DIMMs, two PCI cards, a PCI-E x16 slot, and a PCI-E x4 slot. We also liked the GA-MA69GM-S2H because it has integrated HDMI, optical audio, and DVI and VGA ports right on the I/O back panel. The board's integrated Radeon X1250 also deftly handles HD playback, but at a cost. More on that in a moment.



The SilverStone Nitrogon NT06-Lite secures to the motherboard with a one-size-fits-all back plate and four screws.

Our fanless Radeon HD 2600 XT looks sharp and gets hot.



Rubber grommets on the HDDs cut vibration noise out of the equation.

For our processor, we settled on AMD's 65nm Athlon 64 X2 5000+ ($119; www.amd.com). In *CPU*'s April issue, we noted that the Brisbane version couldn't quite match the performance of the 90nm Windsor variety. But what we're sacrificing in raw power, we're more than making up for in power efficiency and cooler operating temps, which lets us throttle back our fans to keep system noise in check.

We opted to install an aftermarket cooler in the form of SilverStone's Nitrogon NT06-Lite ($49.99; www.silverstonetek.com); you may remember this heatsink from *CPU*'s July Spotlight articles on cooling. Although it didn't perform well in conjunction with overclocking, it does have a very low profile, making it ideal for cramped interiors. The cooler doesn't include a fan, so we used a 120mm Sunon fan we had on hand. We don't recommend using this fan, but we'll come back to that later.

The key to keeping our overall system noise in check lies in keeping the CPU load low while watching HD content. Although the IGP of the Gigabyte motherboard can handle HD video decode, it offloads the lion's share of the work to the CPU, which has been shown to push CPU utilization up to 50% or more. To address this problem, we chose to install a standalone graphics card in the form of Gigabyte's GV-RX26T256H Radeon HD 2600 XT ($108.99). The HD 2600 XT includes UVD (Unified Video Decoder) hardware for HD video decode acceleration on the GPU. The other big reason we felt confident in installing what may seem like redundant hardware was the fact that it cost us nothing in extraneous system noise: The GV-RX26T256H employs Gigabyte's Silent-Pipe II fanless heatsink.

The redundant hardware doesn't stop there. In a bid to further quarantine sound production from the CPU, we installed the Dolby- and DTS-capable Asus Xonar D2 7.1-channel audio card ($189.99; www.asus.com). The onboard Realtek chip would have left much of the sound processing to the CPU; plus, we think videophiles will appreciate the extra audio fidelity.

The TV Tuner we settled on is the Hauppauge WinTV-HVR-1800 ($129; www.hauppauge.com), which has two tuners; one for NTSC analog TV and another for ATSC digital TV. The tuner also offers hardware MPEG-2 encoding, which is a prerequisite for Vista's Windows Media Center application.

Because this system will act as the media server in addition to an HTPC, storage is crucial. With Hitachi's 1TB Deskstar 7K1000 ($399; www.hitachigst.com), we should have plenty of room to store loads of HD/SD content and DVD backups.

The heat spreaders on our memory modules almost touched the underside of our CPU cooler.

We also installed a 10,000rpm 150GB WD Raptor ($189.99; www.wdc.com) to handle the OS and applications.

With regard to HD video disc formats, video enthusiasts aren't likely to pick a side when it could mean some of the movies they love might never make the transition. Thankfully, LG has stepped up with the Super Multi Blue GGW-H20L ($499; us.lge.com). This a BD-RE drive and HD DVD-ROM player. If you want to forego the BD rewriter, you can save yourself some cash with the GGC-H20LI ($399). We also liked that these drives use thin SATA cables instead of wide IDE ribbon cables.

The PSU we picked up is Corsair's VX450W ($79.99; www.corsair.com), which delivers more than enough power and keeps the noise output below 22dBA up to 400W. Memory isn't too vital to our system, so we dropped in a 2GB matched pair of Corsair Dominator 1,066MHz DDR2 modules ($219).

## The Build

The system assembly went mostly flawlessly. The SilverStone Nitrogon NT06-Lite CPU cooler cleared the extra-tall heat spreaders attached to the Corsair memory modules by about an eighth of an inch. We also had to leave the Lian Li's removable crossbar in the junk pile: It wouldn't fit over the SilverStone CPU cooler.

Only after we had our system assembled and sitting next to our HDTV did we notice how loud the Sunon fan was. It's no wonder: The fan has a peak noise output of 44.5dBA. We recommend using the SilverStone FM121 ($15.99), which peaks out at 39dBA but can be adjusted to a whisper-quiet 17dBA.

Another minor snag involved getting HDMI output through our HD 2600 XT. Gigabyte only bundles a component video dongle with the card, so we needed to pick up a DVI-to-HDMI adapter. We found a viable stand-in at NewEgg for less than $10.

Although we didn't test this HTPC as a media server, we recommend the Linksys WMP300N Draft 802.11n wireless adapter ($89.99; www.linksys.com), which should be more than capable of streaming HD content wherever you need in conjunction with a compatible 802.11n network. If you don't want to upgrade your network, then we recommend keeping this HTPC wired for the best performance. ▲

**by Andrew Leibman**

Any videophile would be happy to make space in his A/V rack for this HTPC.

## EYES ONLY

### Operating System: Windows Vista Home Premium

Despite all of the negative press surrounding Windows Vista, it is unquestionably the future OS for most PC users. Vista Home Premium in particular is ideal for home-theater PC owners who want first and foremost to watch movies, as it comes loaded with Windows Media Center standard and gives you everything you need to watch movies and television, including DVR and video-streaming capabilities.

All the peripherals on our recommended list are compatible with Vista, so you should have no trouble using it. As the OS continues to improve and get all the bugs worked out, you will not miss a beat for home-theater applications.

### Peripherals:

It would be a shame to build a killer HTPC and then waste its potential by skimping on all the extras. Where input devices are concerned, it doesn't hurt to look for a mouse and keyboard that look cool *and* give you all the functionality you need. The Logitech MX Air Mouse ($69.95; www.logitech.com) is sleek, smooth, and wireless, and the Wireless Entertainment Desktop 8000 keyboard ($299.99) has all the media buttons you need. Of course, you can just stay on the couch with a good remote; the Microsoft A90-00007 remote control ($38.99; www.microsoft.com) is plug-and-play and will serve all your home theater needs.

And of course, what your ears hear is nearly as important as what your eyes see; try a good set of wireless 7.1 surround sound speakers to catch all the sound depth those Hollywood foley artists and sound mixers spent so much time creating. We recommend Creative's Giga-Works S750 7.1-Channel Speaker System ($465; www.creative.com). With each satellite speaker pumping out 70 watts while the 210-watt subwoofer belts it out as low as 25Hz, those movie explosions will reach a new level of house-shaking. When the rest of the house is asleep but you need to finish your "Matrix Trilogy" marathon, slap on a pair of Sony MDR-DS3000 Wireless Headphones ($229.99; www.sonystyle.com) and enjoy the shell casings tinkling on the floor through Dolby Digital sound.

Finally, be sure to protect all your equipment with a good surge protector. A heavyweight like the Tripp Lite HT1010SAT3 ($129.99; www.tripplite.com) will keep all those components happy and free from electronic burps and surges. All these essentials will enhance your home theater experience, and the best part is many of the items above are wireless, so you won't have to worry about cables cluttering your home theater kingdom.

### Applications: Windows Media Center

Windows Media Center for Vista is ideal for a home theater setup. Aside from the fact that it is packed with features and has a sparkling GUI, it also comes standard with Windows Vista Home Premium, which makes it quite convenient.

In addition to playing stored music and streaming audio, you can schedule Windows Media Center to record any type of television transmission, including HDTV, and even burn DVDs of your recorded programs. It automatically catalogues any video content it finds on your hard drives or elsewhere on your home network and can stream video across your networked devices from the Internet or another source. Add CyberLink's Power DVD Ultra ($99.95; www.cyberlink.com), and you'll have all three video formats covered. ▲

**by Seth Colaner**

"For performance, I give the Thermaltake Toughpower 1200W a 10." – JonnyGuru

"Until now, a consumer power supply being 87% efficient was unheard of." - HardOCP.com

"The Toughpower 1000W is a real monster! And I mean that in a good way." - Tweaknews

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# SPREAD THE SOUND

## A SYSTEM THAT MARCHES TO A DIFFERENT BEAT

For music lovers, DRM can be a real stick in the mud. DRM's more common headaches include limiting copying abilities, blocking you from playing music on specific devices or other computers, or, in one memorable instance, installing rootkits that leave your system vulnerable to attack. Whether you think DRM is the bane of music fans everywhere or just another way to help content creators reign in what's rightfully theirs, DRM is not about making music easy to access. For this audiocentric HTPC, we wanted to cut Microsoft's DRM-friendly OS out of the mix entirely, leaving you to bang the drum for your preferred format.

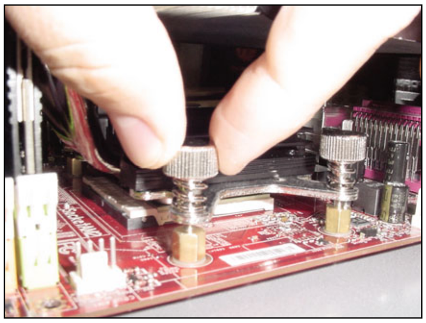
As with any home-theater component, we wanted an audio enthusiast's HTPC that brought the noise without being an eyesore. Key considerations included the ability to store a sizeable music collection recorded in your choice of lossy or lossless formats, serve that music to another location in your home, and also perform the standard HTPC functions, such as PVR and DVD playback. We also strove—and in most cases succeeded—to select components that are known to work with Linux.

### Picking Parts

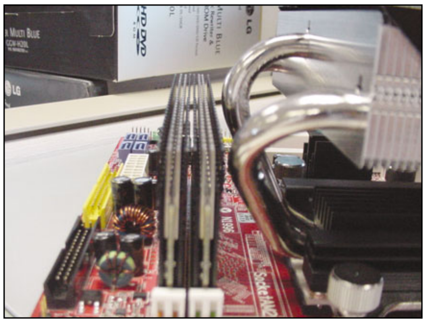
For our audiocentric HTPC, the Antec Fusion ($219; www.antec.com/us) was the perfect choice. This desktop-style case might be mistaken for an A/V component. The brushed-aluminum front panel features a large volume dial, a flush windowed VFD (vacuum fluorescent display), and a flip-style 5.25-inch drive bay door. When this system is in place, the Reset button (framed with a cool white LED) and the front panel ports will be the only hints that this is a PC. The case also includes a more-than-capable 430W PSU and software for controlling the VFD and system volume.

The Antec Fusion only accommodates Micro ATX motherboards, so again we turned to the AMD 690 chipset. MSI's K9AGM2 ($68.99; www.msicomputer.com) is priced right and has the features we need. The integrated Radeon X1250 will handle this system's graphics and video processing and should be plenty sufficient for our purposes. The integrated HDMI port is a nice bonus, too.

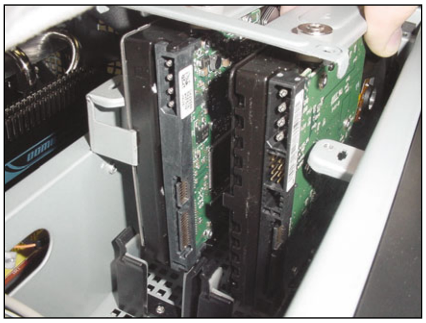
We thought the 65nm version of the Athlon 64 X2 5000+ ($119; www.amd.com) is the ideal choice for a HTPC. In the Socket AM2 family, this processor offered the best price-per-watt ratio as we went to press. To cool the CPU, we again turned to SilverStone's Nitrogon NT06-Lite



We installed the CPU cooler with the motherboard outside of the case to get easy access to all four corners.



The CPU cooler's heatpipes barely cleared the memory modules.



In the Antec Fusion, the hard drives reside in a separate chamber from the rest of the system.

($49.99; www.silverstonetek.com) and the SilverStone FM121 ($15.99) fan, which was powerful enough to remove the heat without drowning out the beat.

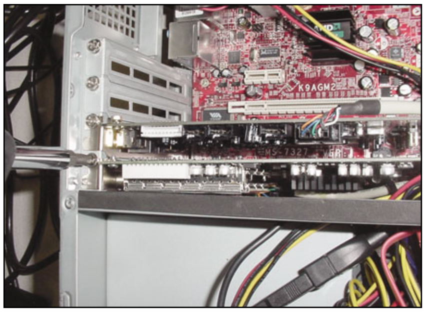
Audio enthusiasts prefer the additional I/O options and dedicated hardware that you get with a discrete sound adapter. We had initially planned to use Creative's X-Fi XtremeMusic card. Regrettably, Creative's X-Fi audio cards don't play nice with Linux. Creative Technologies told us that it plans to support open source in the near future. For the time being, we settled on the Creative Audigy2 ZS (us.creative.com). You may have trouble finding this card at retail, but at press time, several were available on eBay for less than $75.

Some TV tuners are also a generation behind with regard to Linux support. As we went to press, our favorite TV tuner, the WinTV-HVR-1800, wasn't supported under Linux. Again, Hauppauge told us that drivers are in the works, but that any updates would be announced at www.linuxtv.org. We settled on the Hauppauge WinTV-PVR-350 ($142.99; www.hauppauge.com) to handle the system's PVR functions. This card, like the HVR-1800, has hardware MPEG-1/2 decoding support to ensure smooth playback and time-shifting performance.

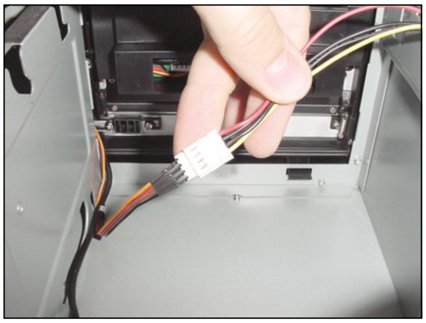
Like with the other HTPCs we built, we used a 10,000rpm 150GB WD Raptor ($189.99; www.wdc.com) to store the OS and applications. For our music storage vault, we chose the 400GB Samsung SpinPoint HD403LJ ($84.99; www.samsung.com), which can hold thousands of albums at even the highest bitrates.

The optical drive we chose for this system was the Lite-On LH-20A1H-185 DVD±R ($31.99; us.liteonit.com). It's not the flashiest ODD you can get, but it plays and burns all manner of CDs and DVDs, and its superior 48X read speed will make quick work of ripping your music collection.

For the system memory, we selected a 2GB pair of Corsair Dominator 1,066MHz DDR2 CM2X1024-8500C5D ($219; www.corsairmemory.com). If you want to save some money, half as much memory should be sufficient to power this machine.



The TV tuner and sound card take up the K9AGM2's only two PCI slots, leaving both PCI-E slots vacant.



This floppy-style power connector powers our VFD.

## The Build

Linux has been playing second (or third) fiddle to Windows since forever, so we expected to run into a few hardware compatibility snags during assembly. Surprisingly, though, the install went smoothly. We were also pleasantly surprised to find that the MX Air Mouse and the diNovo Edge keyboard both worked flawlessly during and after the install.

During assembly, we made sure to connect the 4-pin plug and USB cable to power and transmit data to the VFD. The VFD software that shipped with the case was made for Windows, so we tossed it. Turning to the ever-helpful online community of Linux users, we found drivers and a helpful tutorial at venky.ws/projects/imon. Scroll down to the Standalone iMON VFD Driver section for the download URL and step-by-step instructions. This site also offers links to other pages that helped us install and configure the Microsoft Media Center remote.

After the OS was installed, it immediately recognized the Audigy2 ZS. Right-clicking the speaker icon from the upper-right corner of the screen let us enable and disable our preferred audio device on the fly.

With regard to the WinTV PVR-350, the bundled applications didn't work in Linux, but MythTV was a more than adequate stand-in.

Although the Wireless MediaMVP itself is based on a stripped-down version

Our audiocentric HTPC puts your single-function components to shame.

of Linux, it wouldn't recognize our standalone Ubuntu install without a third-party server client, such as SageTV's MVP Client ($29.95; www.sagetv.com).

Our final task involved installing and configuring the MythTV backend and frontend applications, which recognized and set up our PVR-350 tuner. We used the tutorial found at tinyurl.com/ypkktf. We also took advantage of Ubuntu's Synaptic Package Manager, which made sure we had the necessary prerequisites and kept tricky Terminal commands to a minimum. ▲

**by Andrew Leibman**

# AUDIO IMMERSION

## Operating System: Ubuntu Linux

Linux may seem at first glance to be an oddball choice for an operating system; why not Vista or the mighty Mac OS X? The reason is simple: freedom. In addition to handling all the major formats (with a little legwork in some instances), Linux is, by nature, free from the DRM and restrictive software license agreements that can bog down Mac OS and Windows. By using a standard that's completely open-source, Ogg Vorbis, no one can tell you what you can do with your digital music. The combination of DRM-free music and open-source audio-editing software gives you complete mastery over your music.

Also, remember that Linux is free, so you won't have to grumble about buying extra software. You can even set it up to dual-boot on the same system with another OS, so if you're too attached to Windows XP to let go, you don't have to.

No more format worries, audiophiles. Linux will take care of you. Go download yourself a copy of Ubuntu 7.0.4 from www.ubuntu.com.

## Peripherals

Because this is, after all, an HTPC, you'll want to have the requisite tools for music listening as well as movie viewing that will play nice with a Linux OS. We didn't even need to install drivers to make the Logitech MX Air Mouse ($69.95; www.logitech.com) and diNovo Edge keyboard ($199.99) work with our Ubuntu system.

The diNovo keyboard doesn't have a lot of media buttons, but it has a convenient touch disk that you can use in lieu of a mouse, as well as a slick volume slider so you can select and control your audio from the same place. Both of these devices are wireless, too, so you can maintain control without wires all over the floor. Of course, you can always just stick with a Linux-compatible remote control, Microsoft's A9O-00007 ($38.99; www.microsoft.com). A good surge protector that will protect your precious and expensive equipment without going overboard is the Belkin Pure AV Home Theater Surge Protector ($69.99).

The movie viewing will be just fine, but to make this rig into an auditory wonderland, set yourself up with some powerful 5.1 surround-sound speakers, such as Onkyo's HT-SR700 5.1-channel receiver/speaker package ($339.95; www.onkyousa.com), to be sure you catch every nuance of that orchestral piece or feel like you're smack in middle of a Zeppelin concert. For private listening, avoid the slight decrease in audio quality you get with wireless headphones and plug in a set of Sennheiser HD595 headphones ($289.95; www.sennheiserusa.com). Dolby Digital on these headphones ensures that you won't miss out on the spatial beauty of your favorite piece.

Of course, you can't be without a digital music player to play your latest music downloads through your system, so get a big one with lots of storage, such as the Apple 160GB iPod ($349). At first glance, a device such as an iPod seems wholly incompatible with Linux, but Rhythmbox, which is included with Ubuntu, transfers music to and from your iPod. Plug it in, hit Play, and enjoy.

## Applications

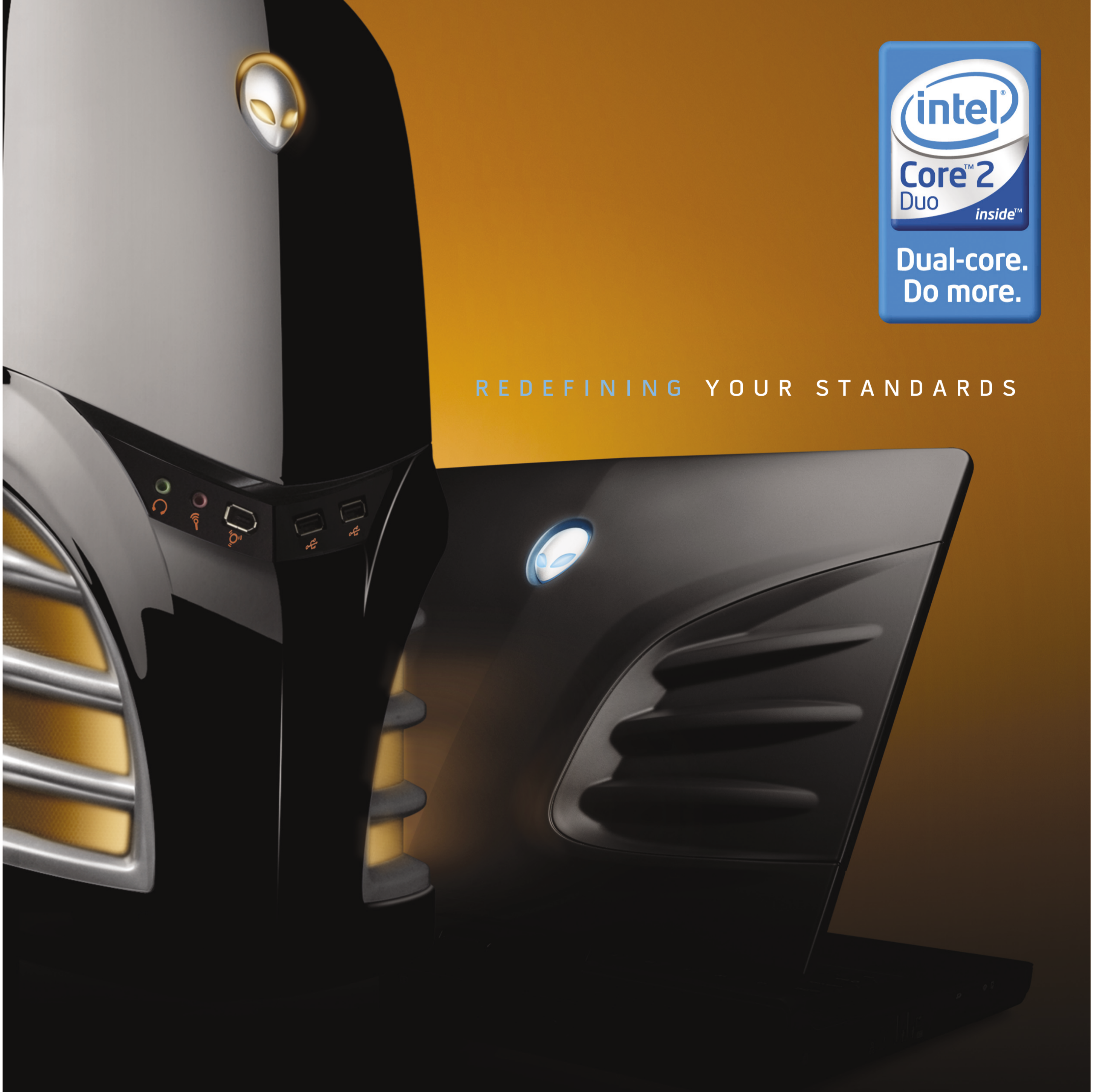
Fans of Ogg Vorbis can really dive into Ubuntu 7.04. But to satisfy the OS' "completely free" philosophy, you can't play restricted or proprietary media formats out-of-the-box, such as MP3, DVD, QuickTime, and Windows Media. To get these media formats to play, visit tinyurl.com/r9oot, scroll to the Playing Restricted Formats section, and follow the instructions to install the appropriate codecs and packages.

You will need to install GStreamer so that Ubuntu can rip and play WMA files; happily, it's included on the OS, so all you have to do is select it when you first try to rip WMA files.

To take more control over your music, we recommend Audacity (audacity.sourceforge.net), which lets you record live audio; convert your old analog media into digital recordings; edit Ogg Vorbis, MP3, and WAV sound files; cut, copy, and mix sounds; and alter the speed and pitch of the music.

What better software to go with your open-source OS than an open-source media center? MythTV stacks up just fine against Windows Media Center. It features a beautiful and intuitive GUI; all the pause/fast-forward/rewind/play features for live TV that we know and love; and support for multiple tuner cards, recorders, and players. Scroll through its menus to find what's on TV and when, or more importantly for the audio elite among us, breeze through your entire CD collection with one finger. The video player module and DVD player will both retrieve all that metadata associated with the movie you want to watch. Did we mention it has built-in videogame emulators, a library for your photos, RSS feeds, weather reports, and a DVD ripper? This is a serious piece of software, folks. ▲

**by Seth Colaner**



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# Click Click Bang Bang

## Make Room For This Home-Theater Gaming Rig

An HTPC that is capable of playing the latest games at the highest resolutions is sure to rub many home-theater enthusiasts the wrong way. Here at *CPU*, we're also aware of the PC gamers who shudder to think of gaming from the keyboard- and mouse-unfriendly sofa. If you count yourself as one of the above, consider this gaming-centric HTPC an amusing experiment. This system is for the rest of us, the folks who love the idea of console gaming but don't want to settle for graphics technology from last year (or the year before). It's time to build a better console.

Our goal with the gaming HTPC will be to cram the latest and best graphics technology, a high-end processor, an HD DVD- and Blu-ray-capable optical drive, and a TV tuner all into an A/V rack-attractive case. And with regard to noise output, well, at least it'll be quieter than our Xbox 360.

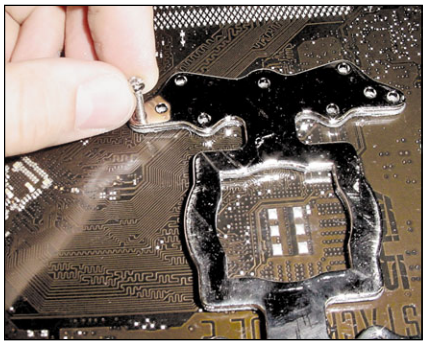
### Picking Parts

Because the graphics capabilities of this system are so crucial, we based most of our part picks around a pair of Nvidia GeForce 8800 Ultras from Asus ($730 each; usa.asus.com). These cards are currently the king of the mountain in terms of raw gaming power. They can crush the competition (and help you crush yours) in current DX9 games and the smattering of DX10 games currently available.

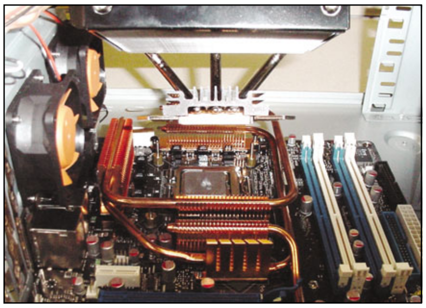
The GeForce 8800 Ultras are 10.5-inch-long dual-slot behemoths, and most desktop cases just don't have the length to support them. Thermaltake's Bach ($109.99; www.thermaltake.com) is the rare exception. This case supports full ATX motherboards and features the optical drive bay and HDD bay directly adjacent to the processor socket, leaving plenty of space for extra-long expansion cards. The case also comes with two crossbeams to which you can mount additional HDDs and fans. Plus, the Bach just looks cool with its blue LED accents and VFD (vacuum fluorescent display) window.

Thermaltake doesn't bundle the VFD module with the case, so we picked up the Thermaltake MediaLAB ($99), which includes the module itself, a remote control, and the appropriate software.

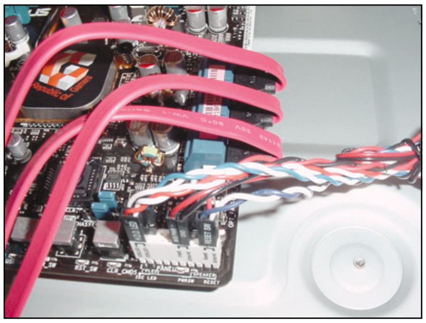
Any Nvidia gaming rig worth its salt has to support SLI, so we selected the nForce 680i SLI-equipped Asus Striker Extreme ($289.99; usa.asus.com) for our motherboard. We love the extras that come with this board, including an S/PDIF and optical audio



The same rear bracket for the SilverStone Nitrogon NT06-Lite works with Intel and AMD systems.



In this orientation, the heatsink collided with the Asus audio module.



The three SATA cables on the Striker Extreme run parallel to the board.

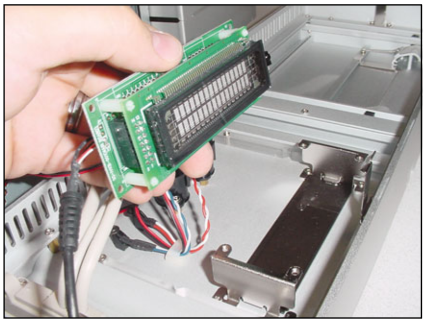
outputs, an LCD Poster (for debugging), and an LED switch built into the back panel. Asus also bundled Tom Clancy's Ghost Recon Advanced Warfighter. Best of all, the Striker Extreme is completely passively cooled.

For our processor, we went with a 2.93GHz Intel Core 2 Extreme X6800 ($999; www.intel.com). The processor supports a 1,066MHz FSB, has 4MB of L2 cache, and, like the Athlon 64 X2 5000+, is manufactured on 65nm technology for a low 65W TDP (thermal design power). Intel's CPU heatsinks aren't any better than AMD's, so we swapped out the noisy stock cooler for SilverStone's Nitrogon NT06-Lite ($49.99; www.silverstonetek.com). For the fan, we went with SilverStone's FM121 ($15.99).

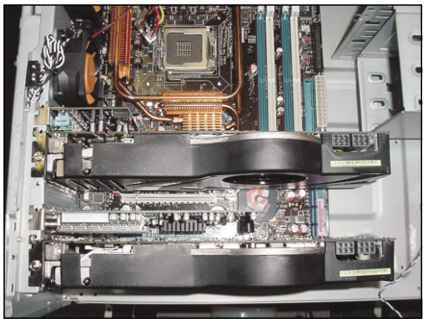
After we installed the graphics cards, however, we encountered a fairly major roadblock. The 8800 Ultras' dual-slot coolers block a PCI and PCI-E slot, leaving just a single PCI slot and Asus' proprietary audio slot open (plus the third PCI-E x16 slot). We had planned on using AMD's PCI-E version of the ATI TV Wonder 650 ($150; ati.amd.com) and a discrete audio card, but our plans had to change. The next best option would have been Hauppauge's WinTV-HVR-1800, but that too uses the PCI-E interface. The only other PCI TV tuner we had on hand was the WinTV-PVR-350 ($142.99; www.hauppauge.com). Both WinXP MCE and Vista support the PVR-350, so it worked for our purposes.

Because sound wasn't our primary concern, we simply installed the Asus Supreme FX audio card. The card will burden the CPU with a portion of the audio processing but still delivers a true high-definition, 8-channel audio experience for games and movies. Plus, with Nvidia's video processing hardware handling most everything else, it's nice to give the Core 2 Extreme X6800 something to do.

Even though we could find decent DVD/RW optical drives for a tenth of the price, we couldn't help but to show up the PS3 and Xbox 360 by adding LG's format-agnostic GGC-H20LI HD DVD and Blu-ray combo player ($399; us.lge.com).



The Thermaltake MediaLAB let us view system information, RSS feeds, news, weather, and more.



The 8800 Ultras take up a good portion of this case's interior.

Hitachi's 1TB Deskstar 7K1000 ($399; www.hitachigst.com) will act as our primary media drive. A terabyte may seem like overkill—until you start DVRing HD content. This drive should hold hundreds of hours of SD and HD video. We split a 10,000rpm 150GB WD Raptor ($189.99; www.wdc.com) into two roughly equal partitions of about 70GB to accommodate the Windows XP Media Center Edition and Windows Vista Home Premium dual-boot setup. This HDD will house our OS, applications, and plenty of games.

For this HTPC, we knew we were going to need a fairly powerful PSU: The 8800 Ultras alone reserve more power than a 430W PSU can dish out. To handle this job, we enlisted the Thermaltake Toughpower W0132RU PSU ($329.99; www.thermaltake.com). The PSU has four +12V rails, an efficiency rate of up to 87%, and a quiet 140mm fan. Another big plus was the PSU's modular cabling, which let us only connect the cables we needed.

To round out the system, we threw in a 2GB pair of Corsair's speedy Dominator 1,066MHz DDR2 CM2X1024-8500C5D system memory ($219; www.corsairmemory.com).

## The Build

When we set out to cram a high-end gaming PC and PVR into an HTPC case, we knew there were going to be difficulties, the most notable of which was the sudden shortage of available expansion slots after we plugged in the dual-slot graphics cards.

Another problem that arose from our choice of graphics cards was that the crossbeam on the left side of the case would no longer fit. This crossbeam accommodates two additional 3.5-inch drives, but we didn't hesitate to toss it aside because our two HDDs fit nicely enough in the alternate 3.5-inch drive bay.

The second crossbeam, which holds another 3.5-inch drive bay, met the same fate because it collided with the SilverStone Nitrogon NT06-Lite. This case is constructed of thick, heavy steel, so we doubt the loss of the crossbeams impaired the case's overall durability.

We also noticed that the Asus audio module collided with the aftermarket heatsink. Thankfully, SilverStone lets you rotate the mounting bracket to make the heatsink's longest edge face any direction. The copper heatpipes of the chipset cooler and the rear panel's 60mm fans forced us to orient the heatsink so that its long edge covered one of the memory modules.

This machine lets you get your game on without having to get off the sofa.

We also found out that it's much easier to add a Vista installation to an existing Windows XP MCE installation. ▲

**by Andrew Leibman**

## Press Start

### Operating System: Windows XP Media Center Edition, Windows Vista Home Premium

Why Windows XP Media Center Edition? Because this is the ultimate gaming system for today, not for six months from now. Gamers will be craving the new DirectX 10 games, but Vista's well-publicized DX9 shortcomings are an issue for all those who still want to play DX9. Still, Vista is the future (and so is DX10), so we decided to use a dual-boot system to accommodate all possible gaming scenarios and take advantage of the more reliable and stable WinXP MCE.

As an added plus, with Windows Media Center on both OSes, you won't have to reboot just to watch television or a movie. And because of the compatibility of the Vista and WinXP platforms, your media files will all be in the same place in your library, so you can move from gaming to tube watching with ease.

### Peripherals

Hardcore gamers don't mess around with less-than-optimum peripherals. You'll want a solid gaming keyboard and mouse, such as Logitech's G7 Cordless Gaming Mouse ($99.99; www.logitech.com) and G15 Gaming Keyboard ($99.99), respectively, and the right remote control, such as Microsoft's A9O-00007 ($38.99; www.microsoft.com). Because the gaming industry mixes some audio in 7.1 surround sound, be sure to have the right set of speakers, such as the Creative GigaWorks S750 7.1 Speaker System ($465; www.creative.com), which let you hear which direction the gunfire is coming from and how far away the enemy is. You'll be able to feel the explosions as much as hear them with these powerful speakers that rumble as low as 25Hz. Warn your teammates with a clear microphone that picks up your voice from multiple directions and lets you to hear their shouts for help on a Medusa SL-8793 ProGamer Edition headset ($120.32; www.medusa-usa.com). If you prefer gamepads to keyboards, you can save their hides with the Logitech Cordless Rumblepad 2 ($39.99), which has all the buttons you need with the convenience of cordless.

This setup gives you gaming control with a keyboard, a mouse with programmable buttons, and a console-style controller, so you can adapt your gameplay accordingly. Both the mouse and the controller are cordless, so you can stash them somewhere other than an entertainment center cabinet without leaving a mess of cords on the floor for family members to trip over.

By the way, in all that intense gaming, don't forget a good surge protector to keep your gear from getting fried. Again, we liked Tripp Lite's HT1010SAT3 ($129.99; www.tripplite.com).

### Applications: Windows Media Center

Although Windows Media Center may not be necessary for gaming, you will at some point want to take a break from blowing up aliens to watch TV or a movie. Windows Media Center will record both standard and HDTV formats, and you can also stream audio and video and play DVDs. For playback, Media Center can't handle HD DVD or Blu-ray, so you'll have to get third-party software, such as CyberLink Power DVD Ultra ($99.95; www.cyberlink.com).

For video, it will keep all your files catalogued on either OS so you can always access them from the same folder. Because Windows Media Center comes on both WinXP MCE and Vista Home Premium, it's always just a few clicks away, no matter which OS you've been gaming on. ▲

**by Seth Colaner**

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# THE SWISS ARMY HTPC

## YOUR HTPC CAN BE YOUR EVERYTHING PC

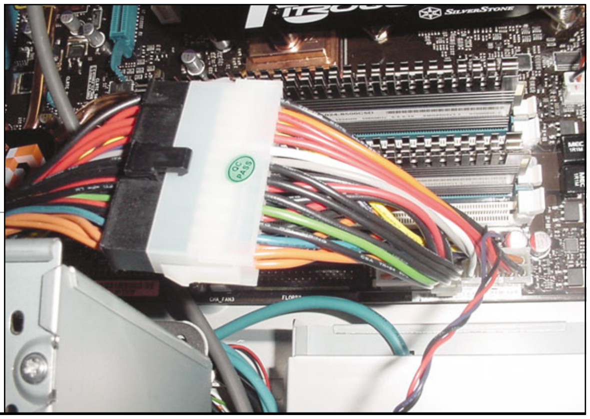
Power users who have one tend to refer to the HTPC as their "other" PC. But just because it's is in your living room doesn't mean it has to be a fraction as capable as a traditional PC. For this build, we took the guts of a high-end rig, grafted on an HD-capable TV tuner, and transplanted it all into the cramped interior of a desktop case.

This Renaissance man in PC pantaloons will master any task you can dream up, including TV capture and DVR functions, HD-DVD and Blu-ray playback, BD burning, gaming, Web surfing, content creation, media encoding, and file storage and serving. The system will readily connect your home theater equipment and output a variety of analog and digital signals. The system should also be quiet for movie and TV watching, but we can only hope the din of gunfire will drown out the GPU fans during our gaming sessions.

### Picking Parts

We started our hunt for an ideal case by narrowing our choices to desktop models that support full ATX motherboards. SilverStone's SST-GD01B-MX ($239; www.silverstonetek.com) is a sleek black case that isn't quite as cavernous as the Thermaltake Bach we used for the gaming HTPC, but it should suit our purposes. This case accommodates two 5.25-inch drives behind a large, slow-opening bay door. The case includes dual 80mm fans on the rear panel. The SST-GD01B-MXR also ships with a multimedia kit, which consists of a VFD, remote, and software.

For this all-in-one HTPC, we knew we would need a motherboard that can accommodate dual graphics cards and still have space for a discrete sound adapter and TV tuner. The P35-based Blitz Formula from Asus ($299; uas.asus.com)



We had to connect the 24-pin passthrough connector to power the VFD (Vacuum Florescent Display).

offers a trio of PCI-E x1 slots, two PEG slots, and two legacy PCI slots. Another of the Blitz Formula's pluses is that the two PEG slots support dual ATI graphics cards in a balanced x8 configuration, rather than the lopsided x16/x4 configuration to which other P35 motherboards default when running multi-GPU graphics.

We were looking for respectable gaming performance, and on Intel's P35 platform, two Radeon HD 2900 XTs ($449.99; ati.amd.com) were a no-brainer. These cards can hold their own in the latest games and offer excellent video quality with ATI's Avivo HD platform. The cards also come with an HDMI adapter and the requisite HDCP keys to allow for true audio and video over HDMI.

For this system's CPU, we shot for the stars: Intel's 3GHz Core 2 Extreme QX6850 ($1,399.99; www.intel.com), with 8MB of L2 cache and a 1,333MHz FSB, will deftly handle anything from professional-level content creation to the most manic multitasking session. Those extra CPU cycles will come in handy when watching HD content. Unlike ATI's lesser Radeon HD 2600 and 2400 GPUs, the HD 2900 XT doesn't have UVD (Unified Video Decoder) hardware, meaning the system will put more stress on the CPU for HD video decode operations.

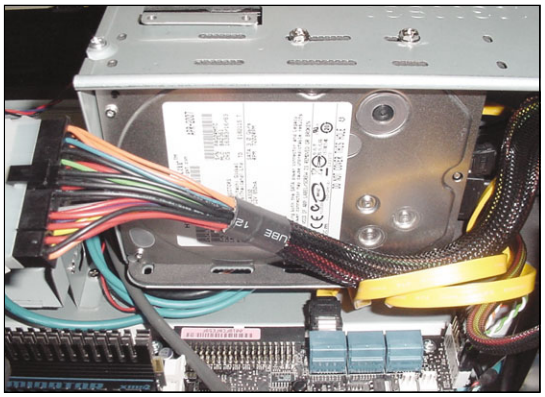
Despite being manufactured at a 65nm process, the QX6850 has a 130W TDP (thermal design power), so an aftermarket heatsink is necessary to keep this baby cool. Again we opted to use the versatile and compact SilverStone's Nitrogon NT06-Lite ($49.99; www.silverstonetek.com). To top the cooler, we installed the speed-adjustable SilverStone FM121 ($15.99; www.silverstonetek.com).

Sound is an important aspect of an HTPC, and for enthusiasts, onboard sound just won't cut it. Creative's X-Fi Platinum Fatal1ty Championship Series sound card ($174.99; us.creative.com) has the extras this system just wouldn't be complete without. In addition to the plethora of analog and digital jacks on the sound card itself, Creative includes a 5.25-inch I/O drive with additional optical, S/PDIF, RCA, mic, headphone, and MIDI ports. The X-Fi Platinum also supports three different audio modes—Gaming, Entertainment, and Audio Creation.

The optical drive we included is LG's Super Multi Blue GGW-H20L Blu-ray Disc rewriter and HD DVD-ROM player ($499; us.lge.com). The drive, which should be available now, supports LightScribe direct disc labeling technology for the authoring applications, a 6X BD-R write speed, and a 16X DVD write speed. We plan to put this drive opposite the X-Fi Platinum's I/O bay.

Once again, Hauppauge's WinTV-HVR-1800 ($129; www.hauppauge.com) handles our TV tuning and DVR functions. This dual-tuner card uses a PCI-E x1 interface and can capture NTSC and ATSC broadcasts. The card's dedicated MPEG 2 hardware is also necessary to support Vista Ultimate's Windows Media Center application.

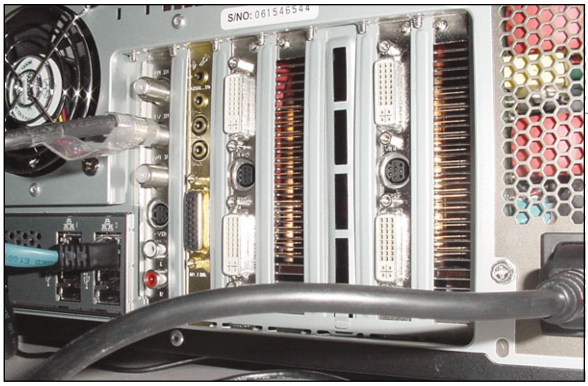
We used the lightning-fast 10,000rpm 150GB WD Raptor ($189.99; www.wdc.com) for our OS, applications, and games. For this all-in-one HTPC to be a hub of entertainment and productivity, it's going to need plenty of storage. Once again, we settled on Hitachi's 1TB



Only two HDDs would fit in the SilverStone case when oriented parallel to the front panel.

Because they took up the most room, we installed the HD 2900 XTs last.

We had to be creative with the cables to fit the top panel back on.



A vented bracket cover between the HD 2900 XTs helped hot air escape.

Deskstar 7K1000 ($399; www.hitachigst.com) to back up our audio and video collection and house hundreds of hours of recorded SD and HD broadcasts. The drive also offers more than enough space to author your own Blu-ray discs.

Thermaltake's Toughpower W0132RU PSU ($329.99; www.thermaltake.com) delivered the goods for our dual-8800 Ultra gaming HTPC, so we used it again. The 1kW PSU has the juice to keep our two HD 2900 XTs running smoothly, and the modular cabling system really helped us make the most of the cramped case interior.

A 2GB pair of Corsair Dominator 1,066MHz DDR2 CM2X1024-8500C5D system memory ($219; www.corsair.com) caps our system specs.

## The Build

The assembly process revealed a few flaws in our hardware choices. We had initially planned to use dual 500GB HDDs in a RAID 0 array, for fast access and 1TB of capacity, but that choice was thwarted by our choice in graphics cards. The SilverStone case can only accommodate three or more HDDs when they're oriented parallel to the sides of the case. In this configuration, the HDDs prevented us from installing the 9-inch-long HD 2900 XTs and the Thermaltake PSU. Two hard drives fit perfectly when rotated to be perpendicular to the sides of the case.

We had initially installed the WinTV-HVR-1800 in the available PCI-E x1 slot between the two HD 2900 XTs, but after noticing higher than expected temps in the BIOS, we moved the TV tuner to the topmost PCI-E slot and replaced the solid bracket cover between the graphics cards with a slotted one for extra ventilation. ▲

**by Andrew Leibman**

# DO IT ALL

## Operating System: Windows Vista Ultimate

It's not hard to figure out why we selected the beefiest OS for this mighty HTPC rig. Windows Vista Ultimate has all the bells and whistles that Microsoft has to offer in an OS. It's loaded with not only Windows Media Center but also greater remote desktop connection, backup and restore, and drive encryption capabilities than other iterations of Vista.

## Peripherals

You want it all—a movie theater at home, an audio paradise, and a gaming super center—and you can have it. The Gyration Air Mouse ($69.95; www.gyration.com) and the Microsoft Wireless Entertainment Desktop 8000 keyboard ($299.99; www.microsoft.com) will cover your basic I/O functions wirelessly without breaking a sweat, and all the media buttons on the keyboard will give you plenty of usability and versatility.

And if you want to make your friends really jealous, control your system with a Logitech Harmony 1000 Advanced Universal Remote ($499.99). It controls up to fifteen different devices with a color LCD touchscreen that greets you with a user-friendly "What Would You Like To Do?" screen. The panache is thrown in for free.

Your speaker setup should be 7.1 channels to take full advantage of gaming movies. The Onkyo HT-S990 7.1 Home Theater Entertainment System ($999; www.onkyousa.com) is a beast of a setup, boasting 110 watts per channel. What separates these babies from the pack is that you can select different options to optimize your surround sound for movies, music, or gaming (THX Cinema 2, THX Music Mode, and THX Games Mode, respectively) without leaving the couch. And when you need to keep all that sound to yourself, don a pair of Sony MDR-DS3000 Wireless headphones ($229.99; www.sony.com) and be whisked away by the Dolby Digital sound without losing the spatiality of the audio.

Add an 80GB iPod ($249; www.apple.com) and Universal Dock ($49) to the mix so when you don't feel like transferring all your music to your HTPC, you can just plug it into your surround sound speakers with your iPod dock; but it's much cooler to play all that audio goodness from your hardcore, jack-of-most-trades HTPC.

## Applications

There was no reason to get fancy and try to find a special multimedia application other than Windows Media Center; it works well, has all the features you could want, and it comes with the OS. That's a tough deal to beat. (You'll need iTunes to manage your iPod, of course.) With Media Center, you can stream music and video from your media library, another device, or the Internet. You can record and pause live television, DVR your favorite shows, and stream HD video. Plus, it easily integrates with the Xbox 360, and you don't have to worry about any configuration issues with the WED 8000.

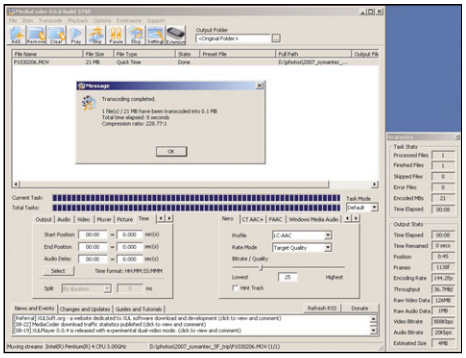
It may seem slightly counterintuitive not to deck out this monster of an HTPC with all sorts of elaborate multimedia software, but the truth of the matter is that Windows Media Center is perfectly capable of handling all the functions we needed. Sure there are alternatives out there, but Vista's Media Center is excellent. Stick with Windows Media Center; it won't let you down. ▲

**by Seth Colaner**

# The Bleeding Edge Of Software

## Inside The World Of Betas

## MediaCoder 0.6.0 Build 3798



**Official Product Name:** MediaCoder
**Version # Previewed:**0.6.0 Build 3798
**Publisher:** Stanley Huang
**Developer and URL:** Stanley Huang, mediacoder.sourceforge.net
**ETA:** Q4 2007
**Why you should care:** A handy and free way to convert audio and video files to almost any other format.

There's no shortage of transcoders out there, which is, of course, software that converts media files from one format to another by essentially playing each frame and resaving it in sequence. That said, there is a shortage of free transcoders that work well and do their job quickly. MediaCoder, however, is just such a program.

Most transcoders require a great deal of tweaking and codec installation, but MC reduces this nonsense to a minimum.

The base installer includes almost all the codecs (such as DivX) and utilities (such as LAME) you'll need to convert almost any audio or video file into a different format and copies the files into their correct locations automatically. There are auxiliary installers for ripping DVDs with DeCSS and an "ancient codec pack" for dealing with, well, ancient multimedia files. There are extra plug-ins for specific CPU optimizations, but that's basically it.

The interface is at once straightforward and confusing. Selecting files or folders of files to convert is easy, but selecting different transcoding options involves two tabbed subsections of the main dialog box that make it easy to miss a key setting. Options for transcoding to portable devices such as the iPod, the PSP, the Zune, and several mobile phones are within the dialog box that appears after clicking the Extensions button in the toolbar. The documentation is sparse, requiring regular visits to the MediaCoder user forums for tips.

Still, there's no arguing with results. Directories filled with dozens of MOVs and AVIs were relatively quickly converted to DivXes with outstanding video and audio quality and with minimal intervention once the process was started.

The beta is a bit rough around the edges, crashing once or twice during my evaluation, but there's potential for MediaCoder, especially at its price of "free." ▲

**by Warren Ernst**

## Transfz 1.3 Beta

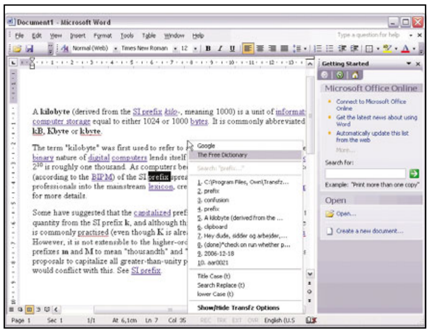
There aren't many "grab-bag" utilities that do a lot of different, handy things these days, but Transfz (pronounced "transfuse") is just such a utility, and you'll wonder how you lived without it. Consuming hardly any RAM or CPU cycles (the executable is just 320KB), Transfz just sits in the Taskbar tray awaiting its hotkey, and then it leaps into action to make your computing life a little easier.

Before describing what it does, here's how to use it. Just highlight a word or set of words within a document or program, including text fields in Web browsers, and press CTRL-D. A pop-up menu appears that offers all sorts of handy features and commands that work with the selected text.

Arguably, the most useful is an Internet Lookup command, which instantly opens your browser (or a new tab) and Googles for the selected text. If you don't care for Google, then Transfz can use Wikipedia, IMDb, Slashdot, the BBC, or any of about 10 online searching tools.

The next is a "permanent clipboard," which stores and displays the 10 most recent Clipboard items. This allows you to copy several things to the clipboard at once and then paste them all again at once, with no tedious "back and forth" between windows or applications. There are also text formatting options that can change all the selected text to ALL CAPS, Upper Case, lower case, and so forth. It can also insert the current time and/or date at the cursor, count the number of selected words, or search and replace within your selection.

A small but growing list of plug-ins are adding more features to Transfz almost weekly, and there's no arguing with the price (free). But it seems to make keypress "sticky" within Office 2007. Hopefully this bug will get chased out as the product goes from "beta" to "final." ▲



**Official Product Name:** Transfz
**Version # Previewed:** 1.3 Beta
**Publisher:** Janus Olsen
**Developer and URL:** Janus Olsen, www.transfz.com
**ETA:** Q4 2007
**Why you should care:** A handy utility you might not be able to live without.

**by Warren Ernst**

# UP TO SPEED

## Upgrades That'll Keep You Humming Along

This month, workhorse programs such as Maya, Google Earth, and Skype gain attractive new features. Meanwhile, Apple iTunes tries to find a place on your blog.

## Software Updates

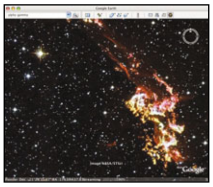
### CCleaner 2.00.491 Beta 2

The hard drive maid has a new installer that won't trip off antivirus programs and fixes a bug in the update checker. The program is better at IE cleaning when the browser is open and new support for Firefox "HttpOnly" cookies. This version also fixes bugs that led to leaving empty folders behind after a cleaning.

www.ccleaner.com

### Google Earth 4.2

The world mapping favorite launches into space with a new Sky feature that lets you zoom into galaxies. A Sky button on the toolbar claims to access 100 million stars and 200 million galaxies. Google is indexing space now.



www.google.com

### iTunes Widgets

Apple expands the reach of its iTunes Desktop player/library to the Web with three widgets that can be embedded on Flash-enabled blogs and social network profile pages. My iTunes Purchases shows your most recent acquisitions, and My iTunes Reviews shows items in your library you have rated highly. Finally, My iTunes Favorites reveals the artists you buy most frequently, which can be a bit embarrassing if you are a closet Britney fan. The widgets come in three sizes.

www.apple.com/itunes/myitunes

### HyperSnap 6.21.02

The screen capture program corrects a problem with autoscrolling not working with some mouse wheel settings. This adds to a previous month's update that allows you to turn off Vista transparency during some captures. A problem with page range printing also gets solved.

www.hyperionics.com

### IsoBuster 2.2

This familiar old friend helps dig into the guts of CD/DVD/HD/BD discs to retrieve lost material. Now it supports command line parameters and the mkisofs El Torito Patch for making boot images. There is a new option for extracting files into a range of formats. We also get GUI enhancements.

www.isobuster.com

### Skype 3.5

The IP-based phone service adds video support, letting users download clips from video sharing sites such as Metacafe and add them as "Moods" in their Skype window or even include them in online chats. The new version also lets you take snapshots in video conferences and transfer an incoming call to another person or group.

www.skype.com

### SpeedFan 4.33 Beta 18

The old reliable fan monitor improves support for nVidia card temperature readings and for a wider range of motherboard fans. Full support is now here for Intel ICH9 and nVidia MCP55 SMBus, as well as ADT7475. You can also find almost any ITE H/M core.

www.almico.com

### Winamp 5.35

One of the early MP3 programs improves translation support of core strings and dialogs. A host of fixes include CDDB handling of non-English characters, compatibility issues with musicbrainz tags, and interface problems in the Vorbis Editor.

www.winamp.com

### Xfire 1.79

The chat and matching tool for online multiplayer gamers increases your Friends limit to 1,000. New supported titles include World In Conflict and GRAW 2. The update includes better compatibility with games running with elevated permission in Vista and for running as a non-administrative user in Windows XP.

www.xfire.com

## Driver Bay

### DivX Codec for Windows 6.7 Beta 1

The video compression codec adds support for the DivX 1080HD profile and custom pixel aspect ratios. It now uses "a combination of bidirectionally coded frames and interlaced video."

www.divx.com

### K-Lite Mega Codec Pack 3.3.8 Beta

The convenient package of the latest audio and video codecs has a new version of Media Player Classic bundled in. The latest revisions of the following codecs are also here: ffdshow, CoreAVC, AC3Filter, AC3Filter.ACM, and the FLV splitter.

www.codecguide.com

### nVidia ForceWare 162.18

This video driver for most GeForce cards is WHQL-certified and works with DirectX9.0c and OpenGL 2.1. There are multiple improvements in game compatibility including Lost Planet.

www.nvidia.com

### Vista Codec Package 4.4.9

With editions for Vista x32 and x64, this bundle of codecs updates AC3Filter and ffdshow to the latest versions and also fixes VCD playback in some Vista versions. It now supports MOV files from cameras and may improve MKV and AVI playback.

www.jtow.net/users/triess

by Steve Smith

# DriveClone 3 Pro

Most backup software can be categorized as either a "drive imager," a "file archiver," or a "snapshot taker." Very rarely does a single product fall into all three of these categories while still doing each job well, but FarStone Technology's DriveClone 3 Pro is one of those products. It isn't without a hiccup or two, but it has all the bases covered to ensure good backups of your whole system, your setup and configuration, and all your data files.

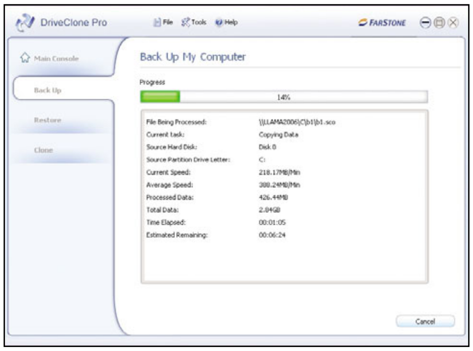
DriveClone works in three modes and adds some useful utilities. The first mode is System Backup, which basically takes a whole image of a drive or boot partition and copies it elsewhere. Almost magically, it manages to successfully copy Windows from within Windows while Windows is running, if you follow me, but other programs need to be shut down. The File Archiver copies sets of files and folders, either manually or on a schedule. The Snapshot Taker works in place of Windows' own System Restore, recording snapshots to a hidden partition on your main hard drive. All three modes also allow for incremental updates, so backups only record changes.

DriveClone can write system backups and file backups to second internal drives, external USB devices, burnable CDs/DVDs, and even over a LAN to a network drive, and it does it all very quickly with compression set to Medium. A Linux-based boot disc allows for restoring from all modes and from all sources, even if Windows won't boot.

Foibles? Just minor ones. The installer doesn't install all of the DriveClone's features by default, which is odd; choose the Advanced installation and follow the prompts to activate everything. Secondly, DriveClone just didn't like one of my PCs, constantly stating "System partition space or continuous space is not enough," even though I was using a 20GB drive with 4GB of data on it. So try the program before buying it. Finally, some PCs just don't like Linux bootable CDs, so test the Restore CD before relying on it.

That said, DriveClone 3 Pro works marvelously and can handle all your backup needs in one slick package. ▲

**by Warren Ernst**



File Being Processed: \\LLAMA2006\C\b1\b1.sco
Current task: Copying Data
Source Hard Disk: Disk 0
Source Partition Drive Letter: C:
Current Speed: 218.17MB/Min
Average Speed: 388.24MB/Min
Processed Data: 426.44MB
Total Data: 2.04GB
Time Elapsed: 00:01:05
Estimated Remaining: 00:06:24

**DriveClone 3 Pro**
$49.99
FarStone Technology
www.farstone.com/software/driveclone-pro.htm
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# Stellar Phoenix Windows Data Recovery 3.0

Though you'll always hear us admonish you all to back up regularly, even the most religious "backer-uppers" sometimes need to retrieve data from unreadable hard drives, floppies, CDs, and various flash-based media. In these cases, Stellar Phoenix Windows Data Recovery is a virtually indispensable tool to retrieve the otherwise irretrievable, provided the underlying hardware is (mostly) working properly.

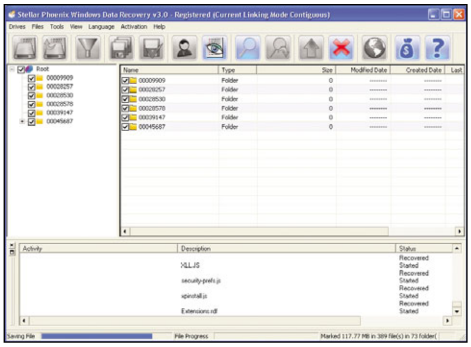
The ideal recovery situation for SPWDR is when a file is lost due to software reasons, such as an accidental erasure or emptying of the trash, file deletions due to viruses or malware, or accidentally reformatting a drive or partition. In these cases, SPWDR manually scans the "empty" areas of a drive looking for fragments of files, which it then reconstructs on its own. If you know the file extension or part of the filename you want recovered, SPWDR can go digging with two scanning methods—otherwise, it just scans the drive and lists everything it can recover. In the case of an older, often reformatted drive, it successfully recovered files we haven't thought of in years.

SPWDR is also handy for recovering files (such as digital photos) from flash drives or memory cards that appear as unformatted volumes in Windows. It successfully recovered hundreds of photos from an "unreadable" SD card from a digital camera in our tests, for example, along with a QuickTime movie file.

Damaged hard drives can be tricky, as the act of recovering data can push a finicky drive into total failure. Fortunately, SPWDR can take a complete image of such drives with just one or two passes and then attempt to recover data from the image file instead of the original drive. If you've ever frozen a drive and found you could only read from it when it was cold, working with an image can be a life-saver.

The only strike against SPWDR is its clunky interface, which had me constantly referring to the Help file to see what different options did or what buttons to click, even after repeated usage. As with most software of this nature, you can try the software to see what it can recover before buying it, but you must purchase it before it actually retrieves any data. ▲

**by Warren Ernst**



| Name | Type | Size | Modified Date | Created Date | Last |
|---|---|---|---|---|---|
| ☑ 00009909 | Folder | 0 | -------- | -------- | |
| ☑ 00028257 | Folder | 0 | -------- | -------- | |
| ☑ 00028530 | Folder | 0 | -------- | -------- | |
| ☑ 00028578 | Folder | 0 | -------- | -------- | |
| ☑ 00039147 | Folder | 0 | -------- | -------- | |
| ☑ 00045687 | Folder | 0 | -------- | -------- | |

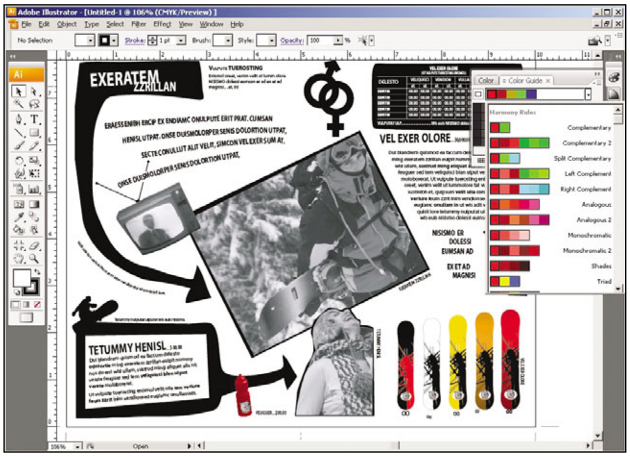
| Activity | Description | Status |
|---|---|---|
| | | Recovered |
| | XLL.JS | Started |
| | | Recovered |
| | security-prefs.js | Started |
| | | Recovered |
| | xpinstall.js | Started |
| | | Recovered |
| | Extensions.rdf | Started |

Marked 117.77 MB in 389 file(s) in 73 folder(

**Stellar Phoenix Windows Data Recovery 3.0**
$99
Stellar Information Systems
www.stellarinfo.com/partition-recovery.htm
● ● ● ●

CPU RANKING ○ 0 = ABSOLUTELY WORTHLESS | ● ● ◖ 2.5 = ABSOLUTELY AVERAGE | ● ● ● ● ● 5 = ABSOLUTELY PERFECT

# Adobe Creative Suite 3 Web Premium & Adobe Creative Suite 3 Design Premium


Adobe Illustrator - [Untitled-1 @ 106% (CMYK/Preview)]
File Edit Object Type Select Filter Effect View Window Help
No Selection
EXERATEM ZZRILLAN
VEL EXER OLORE
TETUMMY HENISL
Color Guide
Harmony Rules

Adobe has learned a thing or two from Microsoft, developer of the *other* huge software suite that offers best-of-breed software titles combined into an indispensable package: Improve the interface, increase cross-application compatibility, offer a dizzying number of versions at varying price points, and eliminate all significant competition. Much as Microsoft Office is the de facto software standard for office productivity, Adobe CS3 is now the de facto software standard for artists and online content creators, especially because the transformation of Macromedia's products into Adobe's is essentially complete. As such, it's impossible not to recommend the latest version of CS3 if you're serious about your work in the art, print, or online fields, especially if you're a version or two behind or regularly swap Flash, Photoshop, and Illustrator files in larger projects.

CS3 is Adobe's first release that combines what used to be Macromedia's Flash, Dreamweaver, and Fireworks software with its own Photoshop Extended, Illustrator, and Acrobat Professional titles. The Web Premium version comes with all these programs, while the Design Premium version basically swaps Fireworks (a Web graphics and prototyping program) for InDesign (a page layout program that succeeds PageMaker). All of these versions' programs share a much more similar interface (due in part to the Macromedia vs. Adobe interface lawsuit being dropped upon their merger) and are able to share files and data streams among each other more easily.

Good examples of this can be found in Flash CS3. Flash now directly imports Photoshop and Illustrator files (these file formats used to be proprietary, but now all the programs are a part of a big happy family), displaying a simple dialog box where you can enable or disable layers and import them as bitmaps or named Movie Clips, convert Illustrator text into Flash text objects, and convert Photoshop layers into Flash Layers or Keyframes. Collapsible and dockable palettes and toolbars now look and feel strikingly like those found in Adobe's original products, yet old Flash hands still feel right at home. There are even small, almost unnoticed integration improvements, such as Flash's Pen Tool now looking and feeling exactly like Illustrator's, including the keyboard modifiers. Most of the bundled programs display similar thoughtfulness in their evolution.

**Adobe Creative Suite 3 (CS3) Web Premium, Adobe Creative Suite 3 (CS3) Design Premium**
$1,599, $1,799
(upgrades are $499 and $599, respectively)
Adobe
www.adobe.com/creativelicense
●●●●◐

The Web Premium version is the slightly larger of the two, consuming an eye-popping 4GB of drive space and taking half an hour to install on a P4 desktop and a full hour on a Centrino notebook. The installer thoughtfully leaves older versions of Adobe and Macromedia products alone save Acrobat, which eases transition worries. The license allows a single user to install the suite on his primary desktop computer as well as his secondary computer, such as a notebook, provided both copies aren't running at the same time. This makes the retail price of $1,599 seem more palatable, though the upgrade price of $499 is a steal considering all the software you get. (Design Premium costs $1,799 retail and $599 upgrade.) Despite their increased bulk, the CS3 versions don't feel significantly "heavier" than their CS2 or MX2004 counterparts, even with a PC running only 512MB of RAM (which is below Adobe's published minimum specs).

In addition to interface tweaking and enhanced data sharing, all of the bundled applications get more features, and in some cases, a lot more than we can cover here. Highlights include:

**Photoshop CS3 Extended:** Adds video and 3D object support, allowing for animation, rotoscoping, video enhancement, and object manipulation in 3D space.

**Illustrator CS3:** Live Color allows for the near-automatic selection of complementary color combinations based on selected pixels or objects based on one of 23 algorithms.

**Dreamweaver CS3:** A new set of AJAX-embedded tools, called The Spry Framework, allows easy embedding of XML data parsing, AJAX-based widgets, and AJAX-based page effects to HTML-based Web pages.

**Fireworks CS3:** Imported Photoshop files maintain their blends, filters, and other more technical attributes.

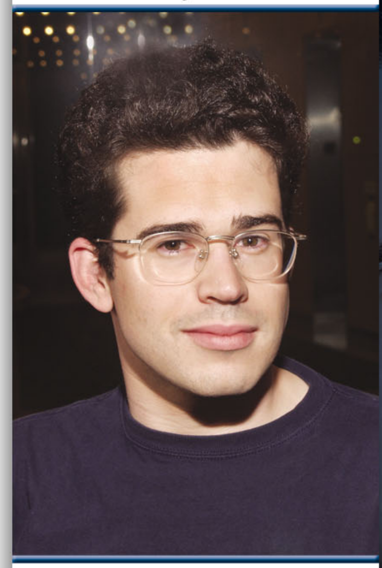
**InDesign CS3:** There are Illustrator-like Live Effects available directly within InDesign, expanded bullets and numbering, enhanced text variables, and enhanced Dreamweaver exporting.

If you're serious about the work that you use Adobe and Macromedia products for, CS3 is a welcome upgrade. For mere dabblers in the graphic art, Web development, or page layout fields, CS3 might not represent the best value around. ▲

**by Warren Ernst**

# People Still Answer Their Emails?!

by Chris Pirillo



*Chris Pirillo drinks Peet's coffee and club soda (never at the same time, however). He's also slightly addicted to coconut juice. He refuses to drink anything with high-fructose corn syrup in it, since low-sucrose pea water tastes much better. His blog at chris.pirillo .com is powered by bubble tea; his videos at live.pirillo.com and media.pirillo.com are driven by egg nog; and that silly ol' blogging network thing found at lock ergnome.com is propelled by—wait for it—genmaicha.*

You know, I really enjoy receiving emails from *CPU* readers, but I thought it would be nice to respond to some of your questions and suggestions so that everyone could learn a little something.

Let's start with Mike, who made me laugh so hard that milk shot out my nose (and I don't even drink milk): "Is there a Beryl for Windows? I know it's different than Mac, but I was just wondering if it could be done like they do in Linux."

Of course, he's talking about the next-generation user experience that's only available on KDE or GNOME desktops. If you haven't seen either Beryl or Compiz Fusion in action, do a search for either one on YouTube or download a Live CD of Sabayon. Real Desktop (real-desktop.de/English/index.htm) isn't a complete replica of Beryl or Compiz, but you might consider buying and installing it in combination with VirtuaWin (virtuawin.sourceforge.net). That should make Windows suck a little bit less.

On the more functional side, I received quite the recommendation from another reader. "Wirelesspacket" clued me into Hamachi (hamachi.cc), an instant, zero-configuration, free VPN. His particular usage model prompted me sit up and take notice: "I have used this to share my home printer over the Internet. I have a Hamachi network dedicated for my family. My brothers and I always share images via our network shares. There is so much potential with this app. I believe you are limited to 16 clients in one Hamachi network, in the Hamachi node you have created your network under. You have the ability to evict a node from your network in order to save slots."

Hamachi is a must-have for any power user with a broadband connection and more than one machine. Considering I've never messed with a VPN before, the Hamachi experience has certainly spoiled me. It's secure and simple—a combination impossible to beat with software. HamachiX (hamachix.spaceants.net) is the unofficial Mac client for the service, but it officially works pretty darn well.

I don't often bring up old reviews or recommendations of software, but "JC" is forcing my hand: "I was reading over Avant Browser and it has some good reviews from other users. It is based on the IE engine, like Maxthon. I remember you have written about Maxthon a few times. Have you ever tried the Avant Browser? I have looked at the *CPU* Web site for a review or a comparison with other browsers but found nothing."

Indeed, I'm a hardcore Maxthon (www.maxthon.com) fan . . . at least, I was. Maxthon 2.0 is nearing gamma stages. (It's been in a very rough beta for a few years.) I've been largely disappointed with some of the UI decisions the Maxthon developers have made. They've messed up the tabbed browsing experience, which was the primary reason I fell in love with Maxthon 1.x back when it was still known as MyIE2. Avant Browser still looks as though it was beaten with the ugly stick, and this new version is no exception. The skins? Yeah, well, beauty is in the eye of the beholder. I may find myself switching to Firefox sooner or later.

On the subject of beauty, let's turn our attention to everyone's favorite mobile media device! iThink Gerald needs a little iHelp: "I just got a 30GB iPod video and was wondering what you recommend for managing playlist and upgrading the firmware without using iTunes."

Without using iTunes? You must be on Windows. As far as managing playlists are concerned, I was going to recommend vPod (vonnieda.org/vPod), but it's not compatible with iTunes 7.3+ iPods yet. Mediafour's (www.mediafour.com) XPlay has always been an excellent alternative iPod management system, but it doesn't work on Vista yet.

Lastly, here's a quick question from "HotShot018": "how do i use eraser plz answer." I can't tell if that was spam or if HotShot018 was asking how to use the BACKSPACE key.

I can't promise to answer every one of your emails in a private or public capacity, but I do thank you for sending them in the first place. C'mon. You know you want to. ▲

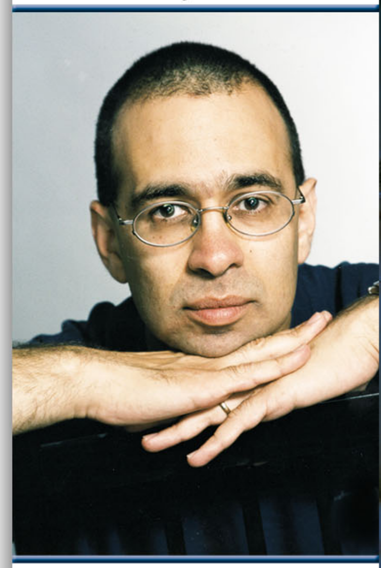
Real Desktop isn't a complete replica of Beryl or Compiz, but you might consider buying and installing it in combination with VirtuaWin. That should make Windows suck a little bit less.

You can dialogue with Chris at chris@cpumag.com.

## Open Sauce

# The Fine Print

by Pete Loshin



This summer, for the first time in 10 years, I purchased a commercially-built Windows PC. I needed a new one, didn't want to build one. And I wanted a taste of Vista, maybe try it side-by-side with Linux. Too bad I never made it past the EULA. But I can tell you one thing: It's still Linux for the win.

In sales, there's a technique called the assumed close. The seller proceeds as if there is no question whether the customer is going to buy. This seems to be Microsoft's approach. Once I turned on the PC (and waited for some mysterious initialization process to complete), Vista offered only one sequence: Accept the EULA; start computing.

If you actually want to read the EULA before you agree to it, you have to find another computer and follow the link (www.windowsvista.com/useterms). I wonder how often anyone does that, but I did. Here's what I discovered.

Accept the Vista EULA, or decline it and return Vista to the retailer for "refund or credit." I followed a link to the North American Retail Product Refund Guidelines (www.microsoft.com/mscorp/productrefund/refund.mspx) for even more joy: You "can easily return any Microsoft retail product* to the retailer from which you purchased it, subject to that retailer's return policy." Too bad Microsoft's list of products you *can't* return includes OEM software preloaded on a PC. Like Vista. Oh well.

Notice that asterisk next to "product"? Microsoft calls them "products" for "convenience," but they're really selling software licenses. Got it? The difference has a lot to do with what you are permitted and prohibited from doing with that software you bought.

Mandatory Activation means Microsoft decides whether your "product" is activated based on information they download from your PC. If Microsoft decides you're not properly activated, they might limit which features of the OS you can use. You can activate by phone to avoid being probed at will, but it'll cost extra.

Genuine Microsoft Software and Windows Genuine Advantage provide benefits. There's the confidence that the software has been properly licensed and peace of mind that the software hasn't been pirated. But those are benefits for Microsoft, not you.

I can remove "Potentially Unwanted Software" with Windows Defender. The first problem here is the issue that I need antispyware software in the first place. And does that mean I can skip the antivirus software? Not really. Oh by the way, if I use Windows Defender, I might remove or disable software I need, or even violate some other restrictive software license. But whatever happens, it's on me, not Microsoft.

Because you have Vista phoning home with validation information, among other things, you want to know that Microsoft will respect your privacy. They'll never divulge your information unless they have a good reason, like being asked for it, protecting their legal rights, or to "act in an emergency." Oh, and if Microsoft decides to change their privacy policy? They'll let you know by posting a notice on the Web. So you're all set with that privacy thing.

The Scope of License section details what you can and can't do. No. 1: Thou shalt "not work around any technical limitations in the software." Remember how Microsoft calls things "products"? If it were really a product, you could do whatever you wanted with it. Because you bought a "license," Microsoft can dictate how you use "your" product.

But at least I have a huge corporation to stand behind me in case something goes wrong with the software. Right? Wrong. Microsoft isn't liable for damages, even if "Microsoft knew or should have known about the possibility of the damages." But if the installation media is damaged, I can (maybe) get a replacement or refund.

After most of a day reading the EULA and following all of Microsoft's links to more information, I discovered even more troubling facts:

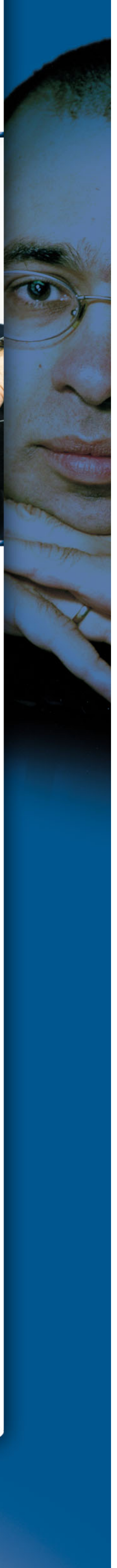
- You can't uninstall Vista. To go back, you must reinstall the old OS.
- Some Windows software won't even run on Vista.
- Microsoft recommends you buy some virus scanning software or service, just to be sure.

I never got to the point of digging out Vista product activation codes and entering them. In the end, I just popped in my Ubuntu installation; 20 minutes later I was all set. ▲

*Pete Loshin, former technical editor of software reviews for Byte Magazine (print version), consults and writes about computing and the Internet. He also runs www.linuxcookbook.com. He owns shares of both Microsoft and Red Hat and believes that Windows isn't for everyone, but neither is Linux.*

> Remember how Microsoft calls things "products"? If it were really a product, you could do whatever you wanted with it. Because you bought a "license," Microsoft can dictate how you use "your" product.

You can get saucy with Pete at pete@cpumag.com



# Where Are They Now?

## Whatever Happened To The Internet Class Of '97?

Now that the Internet has become an unqualified success as a business model, a commerce channel, and a media platform, where in the world are some of its charter members and earliest pioneers? When we checked into the post-bubble histories of some of the founding members of the dotcom fraternity, we found some that were still flying high on the Internet, others gliding low in smaller ventures, and some just missing in action. For instance, Mark Cuban, who sold Broadcast.com to Yahoo! in 1999 for $5.7 billion, now runs HDNet and the Dallas Mavericks and remains as outspoken as ever. Grateful Dead lyricist and digital proselytizer John Perry Barlow founded the Electronic Frontier Foundation in 1990 and continues to lecture, consult, and opine on the field. And Jerry Yang, co-founder of Yahoo! in 1994, is not only still around but just took back his old job running the massive portal he created. But like every graduating class, the first shining stars at dotcom high of the mid-1990s ended up "all over the map," says alumnus Susan Mernit, who ran the influential New Jersey Online news site and developed the pioneering "Yuckiest Site On The Internet" for kids. Mernit went from yucky kid-stuff to romantic adult fare, now as senior product developer, Yahoo! Personals.

### Finding A Lower Profile

Many famed dotcommers such as Mernit are still around but now go about their business with a quieter, lower profile. Many of those whose original products fizzled in the long run managed relatively soft landings themselves as the Web crashed around them. Arguably the team that started the big boom in 1995, Netscape co-founders Marc Andreessen and James Clark have less visible but still powerful roles in the online world. After Netscape's famously lucrative IPO in the mid-90s, Clark kept starting companies such as Healtheon (eventually merging with WebMD and financial services firm myCFO). In an odd twist of fate, Clark is connected to the next generation of Web entrepreneurs by marriage, as his daughter Kathy married YouTube co-founder Chad Hurley. Andreessen followed Netscape when it sold to AOL and became that company's CTO in 1999, but soon after left to start the Loudcloud Web hosting company. Loudcloud evolved into the Opsware software firm, which sold to HP this past summer. Andreessen was still getting big Web paydays in the form of a $138 million payout from this deal. And keeping up with the times, he announced the deal on his personal blog at blog.pmarca.com.

Even more brash and young than the Andreessen/Clark team were Stephen Paternot and Todd Krizelman, whose theGlobe.com community site had the wildest IPO stock ride of all. The day the stock hit the market in 1998 it rose 606%, only later to drop a staggering 99.8% from $97 a share to about 19 cents before NASDAQ de-listed it in 2001. Ironically, only after being part of one of the most infamous IPOs in stock market history, co-founder Krizelman went to Harvard Business School after theGlobe, worked for a magazine publisher, and recently co-founded Magazine Radar.com, which provides sales and market data to the publishing industry. Paternot left theGlobe in 2000 and took time off to write "A Very Public Offering" about that debacle. Like many others from the early Web days, however, Paternot turned to filmmaking and now runs Palm-Star Entertainment, which makes indie films such as "50 Pills." Similarly, David O. Sacks, a former Chief Operating Officer at PayPal (1999 to 2002), co-founded Room 9 Entertainment, which produced the film "Thank You For Smoking."

And what of that nefarious sock puppet brand, Pets.com? Its CEO Julie Wainwright did consulting after that online store failed and just recently became an executive VP at Cobalt Group, a marketing services firm to the auto industry. As for the puppet that hawked Pets.com on $2 million Super Bowl ads? The puppet has become the Gary Coleman of dotcom mascots, working as a pitch dog for obscure businesses. The puppet was sold in the company liquidation for $125,000 and can be found pushing auto loans for 1-800-Bar-None.

### Finding Their Niche

Many of the dotcommers have had long and varied journeys through the online and offline landscapes. Yahoo!'s Mernit crossed many of their paths as she herself bounced among companies and

Q&A

## Josh Harris: From Pseudo To Apple-Picking & Back Again

As founder of one of the first Internet streaming media networks, Pseudo Programs, in 1994, Josh Harris was among the most visible and vocal figures on the New York dotcom scene. His company parties were infamous, and his personal life became public when he started broadcasting it as live streaming video toward the end of his tenure at Pseudo in the late 1990s. Harris now runs the user-generated video project Operator11.com and retains many good and bad memories of the first bubble years.

**CPU:** Pseudo was famous for its parties. What were some of the most outrageous moments?

**Harris:** Did one when we took over the artist Mark Kostabi's space. Pseudo launched a new multiplayer game called Quake. Held a three-day marathon and invited players from around the world to live, eat, breathe, and play Quake for 72 straight hours. The peak of all the parties was at the Millennium. One month long, $1.5 million of my personal dough, and arguably the greatest party ever thrown in the history of New York City.

**CPU:** If I recall, you turned the cameras on yourself toward the end of Pseudo and chronicled your own life. What was that about?

**Harris:** You mean "We Live In Public," where I spent three months together with my fake girlfriend, Tanya. Kicked her out and spent three more months descending into a controlled nervous breakdown. I needed to go all the way down the rabbit hole to fully understand how to do Operator11.

**CPU:** When Pseudo finally closed, what did you do for the next year or two?

**Harris:** Five years alone on my apple farm. Learned the key lesson of that industry from Harold Albinder, who packed my apples and basically screwed me on the payouts. Harold always reminded me that "if you want to make a small fortune in the apple business, start out with a big one."

**CPU:** Did you lose your shirt in the Pseudo demise and have to start over, or was it not as bad as all that?

**Harris:** One day while doing "Living In Public," I was chatting with one of my artist friends in the control room. As I watched the stock market reports, my comments went something like: "Hey Alfredo, just lost a million bucks." Ten minutes later: "Hey Alfredo, I just lost 2 million more." All in, I wound up with enough to fund Operator11 to this point. If it makes it, I am back in the cash; if not, I will be flipping burgers . . . for real.

west and east coasts. "After the crash, people who could afford it often went underground for a while," she says. "A lot of people in California took long trips to places like Thailand. There were people who could kick back and live inexpensively and then return." Mernit herself worked for Advance Publications, running the Netscape portal for AOL, and then helped the company integrate with Time Warner during that fateful merger. "2001 to 2003 were the really dark days," she recalls. "Division heads changed every three to six months." During AOL's "free fall," she helped launch a major Webcast gossip show that was getting 100,000 users most nights, only to get laid off three weeks after its well-hyped launch.

Mernit was a successful consultant for several years, but as the second Web wave grew, she was lured back into the Internet business by seeing some of her buddies return to Silicon Valley and cashing in. "I was just selling time. They were having 'liquidity parties,' which means they had just sold their companies for a lot of money." Back in the game, she is developing strategies for Yahoo! Personals after she herself experienced the pain of using lesser dating sites. Clearly, however, the go-go years of mindless expansion were over. For this post two years ago, "I did sixteen interviews and then they offered me the job."

**Founder of the famed Yuckiest Site On The Web and pioneer of Internet local news content, Susan Mernit now develops Yahoo! Personals.**

"It was a wild six-year ride," says Peter Granoff, co-founder of Virtual Vineyards, a pioneering wine e-tailer in 1995. His company eventually crashed after merging with WineShopper at the height of the boom. "It was a wacky period of business history." Venture capitalist shenanigans at the firm and inflated expectations about the real size of an online wine market led to a quick crash. "The descent was just as irrational and as fraught with hysteria as the ascent," he says. And it left him admittedly bitter. "I rode a motorcycle around the Western U.S., hiking and thinking, and then over time the anger fades and you have to get on with your life."

Ironically, after some of the requisite post-bust

Netscape co-founder Marc Andreessen opining at a Web conference in Japan in 1997 . . . and opining at a Web 2.0 conference in 2006.

consulting work, Granoff went from e-commerce pioneer to the old-fashioned retail world of a wine shop in San Francisco. Now he is working back into e-commerce but sees much of his online traffic coming from people down the street placing pick-up orders. The "Virtual Vineyard" man is now "a believer in the integration of the Web with the brick-and-mortar experience."

## Samaritans & Sinners

Venture capitalists throwing money at any venture with a dotcom suffix is a recipe for abuse, and the bubble era produced its fair share of bad boys. In 1998, Oppenheimer Fund analyst Henry Blodget made his mark by predicting Amazon stock would hit $400, and he became the Pied Piper of overvalued Internet stocks. Later at Merrill Lynch, his overly optimistic predictions helped the investment banking firm land these dotcom clients, a conflict of interest that resulted in a $4 million fine and banishment from the securities trade. Ironically, Blodget resurfaced in the mid-2000s to cover the Martha Stewart insider trading trial for Slate.com, where he continues as commentator. Now a consultant and independent analyst, the Blodget saga continues at his InternetOutsider.com blog.

Dubbed the "poster child for e-commerce failure," the UK's Boo.com burned through $130 million in investor cash by 2000, in part by erecting a site no one used, but mostly from a staggeringly extravagant office lifestyle. Co-founders Ernst Malmsten and Kajsa Leander netted only $187,000 from a subsequent book about their missteps. Malmsten now stays out of the public eye running an agency for creative talent, and Leander is a housewife in Venice, Italy. Another dotcom high-flier, Marc Collins-Rector, actually became a fugitive. The co-founder of early Web video studio DEN (Digital Entertainment Network) burned through $60 million of investor money and fled to Spain in 2000 when he was accused of using some of that money to seduce underaged boys. Arrested overseas in 2002 and extradited, Collins-Rector pled guilty in 2005 to transporting minors across state lines for sexual purposes. He got no further jail time and turned up this summer in London, where the press found him escorting young men around town.

And recording all of these shenanigans at the time was the enfant terrible of the dotcom crash, Phillip "Pud" Kaplan, whose F**cked Company Web site was filled with purloined memos and relentless gossip about what was going on in these poorly run companies as they crashed and burned. Kaplan, who was never at a loss for words to the press back then, did not answer our requests for comment now that he is the head of his own successful firm, the online ad marketplace AdBrite.

For all of its invisible empires and hype-driven antics, the dotcom era did produce some fortunes that in the right hands are doing good. The founder of eBay, Pierre Omidyar, created a $400 million Omidyar Network fund to invest in nonprofit and for-profit efforts to empower individuals worldwide. He donated $100 million to Tufts in 2005. And GeoCities founder David Bohnett went on to work with NetZero, LowerMyBills, and Xdrive. But he also established the Bohnett Foundation, which distributes grants to civil rights groups and funds scores of "CyberCenters" nationwide that provide gay and lesbian communities with Internet access to education, information, and recreation.

And so, the dotcom era was not all about crashing, burning, and skulking away into obscurity. Many of those early innovators are back and feeling a little vindicated by a Web that has caught up to their early ideas. Granoff is proud that his Virtual Vineyards proved you could go directly to the consumer with wine and circumvent old institutions. "We sold $50 million in wine without ever quoting a review score or a critic," he says. Mernit, too, says that many of her colleagues from the early years are still in this game because of a fascination with the new machines and how they affect lives. "For a lot of the people I started out with, this is a passion that turned into a business. I fell in love with the technology and what it could do for consumers." CPU

---

**by Steve Smith**

## Infinite Loop

### www.vanity.net

All parents want what's best for their children. To give them a leg up in the world, many are acquiring domain names for their progeny at birth. Most parents are doing it just to give their kids an online identity. For some, it's to grab a name before someone else does, or get one that will be easy to remember. In an extreme case, one set of parents would only go ahead with a name for their child if that domain was available.

www.technewsworld.com/story/58965.html

## The Department Of Stuff

by Rob “CmdrTaco” Malda

# digital distribution.txt

Recently I attended a dinner party of mixed ages. I spent some time discussing music with an entertaining 10-year-old. I’m always concerned that I’ll disconnect with today’s popular music. I don’t listen to the radio anymore save my precious NPR, and my music comes almost entirely from albums recommended by others or discoveries on mix CDs. I actively try to seek out the top hits of radio every few days, and I like to know what kids today like to listen to.

Now this young man tells me that I might not know his music. “They’re an old group, so you probably haven’t heard of them. The Talking Heads?” I laugh and explain that I do in fact know of them. So I ask him what albums he likes best, and that’s when I discovered something surprising: He didn’t know. He knew a number of songs but not a single album title. This seemed odd to me: My childhood was filled with cassettes. I knew my albums because I had to insert the tape in the slot and press Play. He had no concept of albums because he simply would scroll through his dad’s MP3 collection and find artists and songs that he liked. The “album” has, to him anyway, become a dated and meaningless container.

Now let me be clear; I don’t think that this is a problem. Few artists these days create cohesive albums anyway. Instead, they throw a few singles on a disc with some disposable minutes of mediocrity. Artists who attempt to create a concept album blow people away simply because they make it clear that they are considering more than the radio hit single and getting people to buy a $15 CD based on the strength of that track.

All of this is the direct result of technology. It was a pain to fast-forward through tapes. Even skipping songs on vinyl is fairly inconvenient . . . and halfway through, you need to flip the thing over! But CDs made Shuffle possible on an album, and the MP3 player made it possible to shuffle through your entire music collection. The biggest loss I see with all of this is that it becomes harder to hear the growth of an artist when your exposure to that artist is putting 120 of his songs on Shuffle.

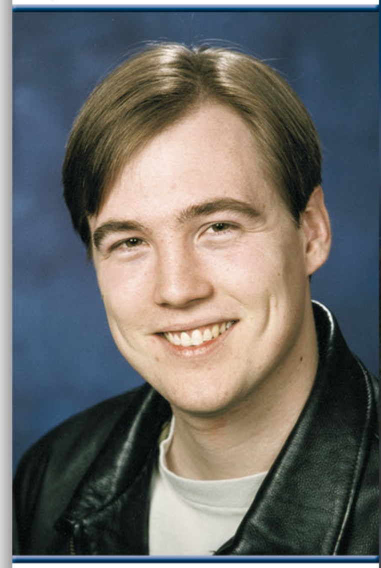
The music you listen to isn’t the only thing affected by changes in distribution and technology. In the last few years, the PVR has made it possible for you to queue up a few shows and watch them on your own time. I do things unthinkable a decade ago: If I’m tired and it’s 10:30, I’ll watch a sitcom instead of a drama, because I want to go to bed at 11 p.m. and not 11:30 p.m. I want a fluffy short comedy. My own schedule made my decision for me, not ABC. If ABC had its way, at 10:30 p.m., my only choice on TV might be to start halfway through a drama.

And then there are TV shows on DVD. How many people have told you that “Lost” or “Heroes” are good, but that you need to start at the beginning? This would have bordered on impossible a decade ago, but the inexpensive production costs of creating a DVD compilation of a season of TV has created a fantastic revenue stream for content creators, a collector’s item for fans, and for the more casual viewer, an easy entry point into any show you desire. But this makes content created a decade ago just as accessible as the next episode of your favorite network drama that you lust all summer for.

Netflix speeds up the online video distribution process and lowers the costs, but the final step is for networks to simply start streaming shows directly to people. This is where the iTunes video content and the AppleTV break down in pricing structure. When compared to cable, satellite, or Netflix, paying $10 to iTunes for a movie or $2 for a TV show gets pretty silly pretty quickly. The networks will eventually figure this out and will find a more reasonable pricing structure. No longer will we store our content locally; instead, we’ll just stream it, probably with advertising embedded and ridiculous DRM that prevents fast forwarding through the commercials.

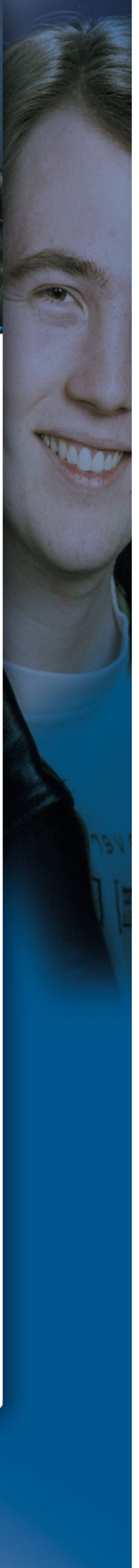
A 10-year-old kid doesn’t know what albums he likes. A decade from now, he won’t even know in what year his favorite show was new, much less what channel it was on. He’ll just choose it from a big menu. I can’t imagine what it will cost. ▲

Contact me at malda@cpumag.com.



*Rob "CmdrTaco" Malda is the creator and director of the popular News for Nerds Web site Slashdot.org. He spends his time fiddling with electronic gizmos, wandering the ’Net, watching anime, and trying to think of clever lies to put in his bio so that he seems cooler than he actually is.*

When compared to cable, satellite, or Netflix, paying $10 to iTunes for a movie or $2 for a TV show gets pretty silly pretty quickly.



# WHAT'S IN YOUR POWER SUPPLY?

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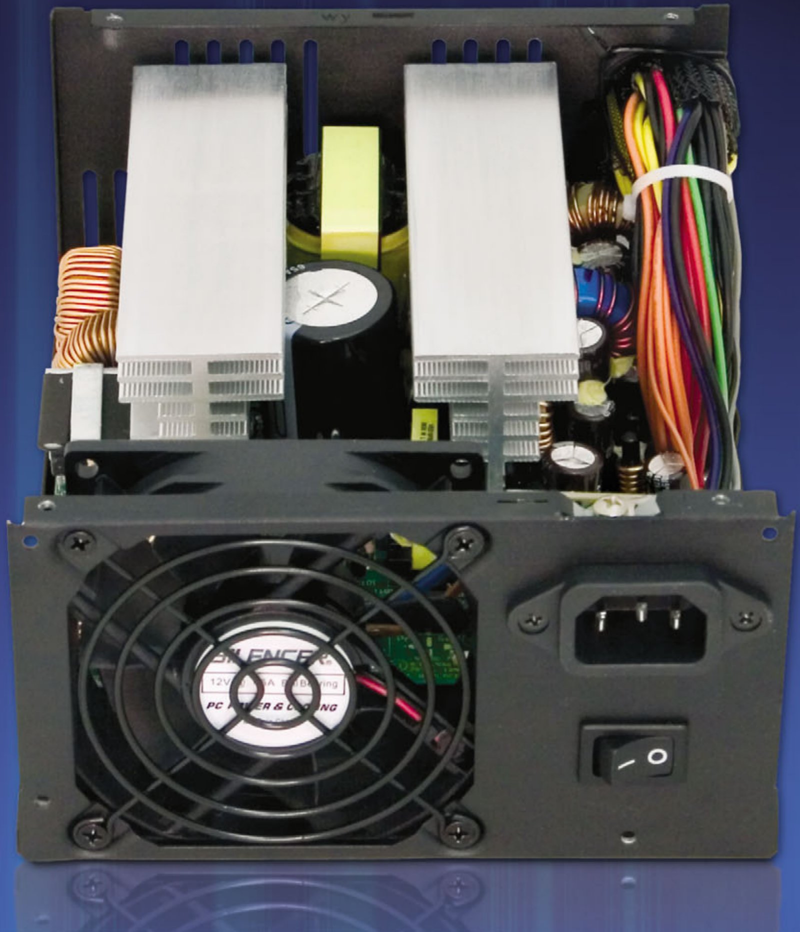

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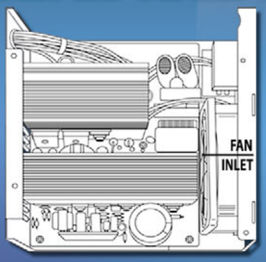
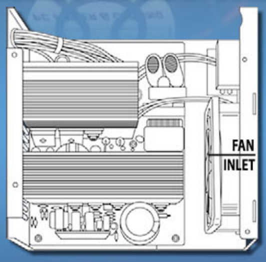


*Power supply with obstructed fan inlet.*



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# ROAD Warrior

by Jennifer Johnson

## Fujitsu Introduces World's Smallest Convertible Tablet PC

Fujitsu's LifeBook U810 gives you full notebook power, yet weighs only 1.56 pounds.

Fujitsu's new LifeBook U810 (prices start at $999), a convertible notebook, is a bit of a mixed breed, crossing the lines between UMPCs, tablet PCs, and ultra-portable notebooks. Claiming to be "the world's smallest tablet convertible," the U810 weighs a mere 1.56 pounds and combines the portability of a UMPC with the touchscreen capabilities of a tablet PC. The U810's lid contains a 5.6-inch rotating WSVGA Crystal View (which Fujitsu claims reduces glare and produces clearer images than traditional laptop displays) LED display. Left in clamshell mode, the U810 is a small notebook with an ultra-slim QWERTY keyboard. Twist the screen around and fold it over the keyboard to get a Tablet PC that responds to both finger and pen input. For a more desktop-like experience, buy a docking station for easy connection to an external display and keyboard.

Better yet, the U810 isn't lacking in features in comparison to some of its bigger notebook brothers: The U810 claims 5.5 hours of battery life, has 1GB of RAM, includes 40GB of storage space, and comes with your choice of Windows Vista Business, Windows Vista Home Premium, or Windows XP Tablet PC Edition 2005. It also has an integrated camera for videoconferencing and taking digital pictures. ▲

## The Next-Generation Razr, Times Three

Motorola's much-anticipated update to its popular Razr, the Razr$^2$, has made its debut. Three models in the Razr$^2$ family (V9, V9m, and V8) cover all three major technologies (and thus all major carriers) available in the United States. The V9 is a 3G, HSDPA (High-Speed Downlink Packet Access) phone that will be available through AT&T. Look for the V9m with 3G EVDO connectivity through CDMA carriers such as Alltel, Sprint, and Verizon Wireless. T-Mobile will carry the GSM-compatible V8 model. Even though all models stem from the same family, the similarities will only be skin deep, since each carrier will tweak and modify the phone with its own software.

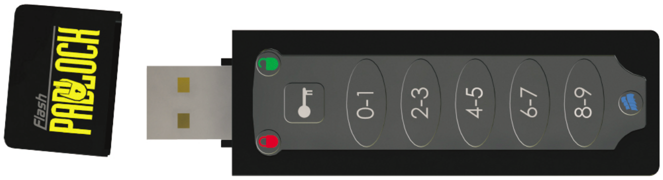
All models feature larger internal and external screens in comparison to the first-generation Razr. On the external screen, you can view media, music, and messages without opening the phone (depending on which features your carrier enables). Music lovers will appreciate the support for popular music formats and media services such as MTV Urge, Yahoo!, and Napster. The Razr$^2$ also has built-in stereo Bluetooth for listening to music wirelessly through compatible Bluetooth stereo headphones. The V9m is available from Sprint for $249 with a two-year contract. It's also available from Verizon Wireless for $299.99 after mail-in-rebate and a two-year contract. Additional carrier pricing was unavailable at press time. ▲

Watch video on the Razr$^2$ V9m's large, external screen from Motorola and Sprint without opening the phone.

## Keep Your Data Under Lock & Key With Corsair

Whether you accidentally left your flash drive at a hotel, misplaced it, or if someone has stolen it, the result is the same: You're without your data and left to wonder who may be trying to access your files. You've probably seen numerous encryption programs that promise to protect data stored on a flash drive. Although a good step, these programs can be susceptible to brute force hacks if the flash drive falls into the wrong hands. With the Flash Padlock from Corsair, however, you can add an additional layer of protection. This flash drive uses hardware, rather than software, to secure your mobile data.

The Flash Padlock has an autolocking feature that locks and protects data after removal from a computer. To unlock and use the drive, a user must enter the appropriate PIN on the number pad located on the front of the device. For convenience, you can select your own PIN, up to 10 digits long. The Flash Padlock is platform-independent and doesn't require additional software to operate on Windows, Mac, or Linux machines. You can buy the Flash Padlock in two storage capacities: 1GB ($29.99) and 2GB ($39.99). ▲



Secure your mobile data with the Flash Padlock from Corsair.

## Sirius Reveals The Stiletto 2

If you're unsatisfied with the current satellite radio players, be patient. A new option is coming this fall. Sirius recently announced the Stiletto 2 ($349.99, plus monthly subscription fee), a refresh to the Stiletto 100. The new Stiletto 2 is more than 25% smaller and lighter than its older sibling, weighing 4.3 ounces and measuring 4.3 x 1.9 x 0.6 inches (HxWxD).

The Stiletto 2 features enhanced Wi-Fi connectivity and the ability to store up to 100 hours of live programming. With the enhanced connectivity, the device now supports a larger number of networks and commercial Wi-Fi hotspots. It also lets you access standard Sirius Internet Radio. (Access to Sirius Internet Radio's premium audio quality is available for an additional subscription charge.)

Internal flash memory can store Sirius content, as well as MP3 and WMA files for playback when a live signal is unavailable. For additional storage, the Stiletto 2 has a microSD slot. You can create stored content in three ways: using the Love feature that will save the song you are currently listening to, setting up scheduled recordings, or creating Radio Replays, which are stored broadcasts from your favorite music channels. Another handy feature is the ability to bookmark and purchase songs through any Windows-based online music service.

The Stiletto 2 will come with a new Altec Lansing antenna headphone, ear buds, PC cable, My Sirius Studio software, and a user-replaceable battery that supports four hours of live satellite playback, 10 hours of Wi-Fi playback, and 20 hours of nonlive playback. ▲

The Sirius Stiletto 2 has enhanced Wi-Fi connectivity that gives you access to Sirius Internet Radio.

## Hotmail Heats Up The Competition

Just out of beta a few months ago, Windows Live Hotmail is already introducing new features. For starters, storage capacity receives a boost, with more than double the current capacity. Now, Hotmail users will see 5GB of storage space in their free accounts. Hotmail Plus users, you'll get 10GB. Although still limited in comparison to AOL's and Yahoo!'s unlimited capacity, Live Hotmail leaps past Gmail's storage limit of nearly 3GB.

For users who want to get straight to the point, you can now skip the MSN Today screen and go directly to your inbox after logging in. Another new feature lets you send an automatic Vacation Reply to let people know when you're away from regular email access.

If you're like the rest of us, you've created multiple contact entries for the same person at some point. Hotmail now has a duplicate contact removal feature that will help you clean up these duplicate entries and eliminate future copies. Finally, for those of you with multiple Hotmail addresses, you can now consolidate your mail by forwarding it to a single Hotmail address. If you're currently using the old-school version of Hotmail, upgrade to Live Hotmail for free through your account's Options menu. ▲

# At Your Leisure

The entertainment world, at least where it pertains to technology, morphs, twists, turns, and fires so fast it's hard to keep up. But that's exactly why we love it. For the lowdown on the latest and most interesting releases in PC entertainment, consoles, DVDs, CDs, and just leisure and lifestyle stuff we (for the most part) love and recommend, read on.

## Audio Video Corner

by Blaine A. Flamig

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Lost Highway Records
www.losthighwayrecords.com

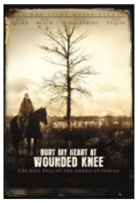
### Lyle Lovett And His Large Band—"It's Not Big It's Large"

Some musicians shouldn't go a year without making a record, let alone four. Yet, it's been that long since the genre-defying Lyle Lovett, a true Texas-born songwriting treasure, has released an album's worth of fresh material. "It's Not Big It's Large" is more somber, reflective, and slower-paced than the bitingly humorous "Lyle Lovett And His Large Band," Lovett's last "Large Band" release in 1989. Still, Lovett's lyrics on his current work are as thought-provoking and emotionally investing as any Lovett record. Steeped in blues, Texas swing, gospel, and jazzed-up country, songs such as "Ain't No More Cane," "The Alley Song," "South Texas Girl," and "All Downhill" continue to put Lovett in an indefinable songwriting category he's seemingly made all his own.

$18.98
Virgin Records
www.virginrecords.com

### Ben Harper & The Innocent Criminals—"Lifeline"

Ben Harper is often labeled as a modern-day Otis Redding, which isn't the worst thing someone can say about you. Still, those familiar with Harper's straight-to-the-matter lyrics, massive bluesy guitar chops, and drowning-in-passion vocals know he can ably stand on his own merits. "Lifeline" may not completely distance Harper from the comparisons to Redding, Bob Marley, and others, but its variety and nearly flawless execution certainly won't hurt Harper, either. Recorded live to analog tape and mixed (no computers or pro tools involved) in one week in late 2006 in Paris, "Lifeline" is expertly played (check out Harper's slide work on "Paris Sunrise #7"), sung (his pleading on "Needed You Tonight" is mesmerizing), and flavored ("Put It On Me" is sinfully tasty).



$26.98
HBO Home Video
www.hbo.com

### Bury My Heart At Wounded Knee

Based on Dee Brown's book, "Bury My Heart At Wounded Knee" has the greatest of intentions at depicting the events that transpired from the massacre of General Custer's army in 1876 through the brutal killings of Native Americans at Wounded Knee about 15 years later. "Wounded Knee" uses the perspectives of forward-thinking Senator Henry Dawes (Aidan Quinn); Charles Eastman (the great Adam Beach), a Dartmouth-educated Sioux physician; and Sitting Bull (August Schellenberg), the Lakota leader who fights the U.S. government until the bitter end. Although slowly paced, heavy-handed, and stilted in many scenes, "Wounded Knee's" historical perspective still makes it worth a view.

$19.99
Lionsgate
www.lionsgate.com

### Away From Her

Rather than being a one-dimensional, tear-jerking lament to the tragedy that Alzheimer's Disease inflicts on family members of those with the disease, the excellent "Away From Her" is an honest look at the frustration, anger, loss, and even hope Grant (Gordon Pinsent) survives after placing his wife of nearly 50 years, Fiona (Julie Christie), in a facility due to her worsening condition. A mandatory 30-day separation from Fiona leaves Grant barely hanging on, but his condition deteriorates further after finally seeing Fiona again and she barely remembers him. Director Sarah Polley approaches this painful topic with obvious sincerity, and the performances she elicits from her cast are top-notch.

**See the full reviews from A/V Corner at www.cpumag.com/cpunov07/AYL**

## DVD Byte

**10/9**
28 Weeks Later
Evan Almighty
Reign Over Me
Surf's Up

**10/16**
The Invisible
The Hoax
A Mighty Heart

**10/23**
Hostel: Part II
Meet The Robinsons
Mr. Brooks

**10/30**
Spider-Man 3
Talk To Me
Captivity

# BIOSHOCK

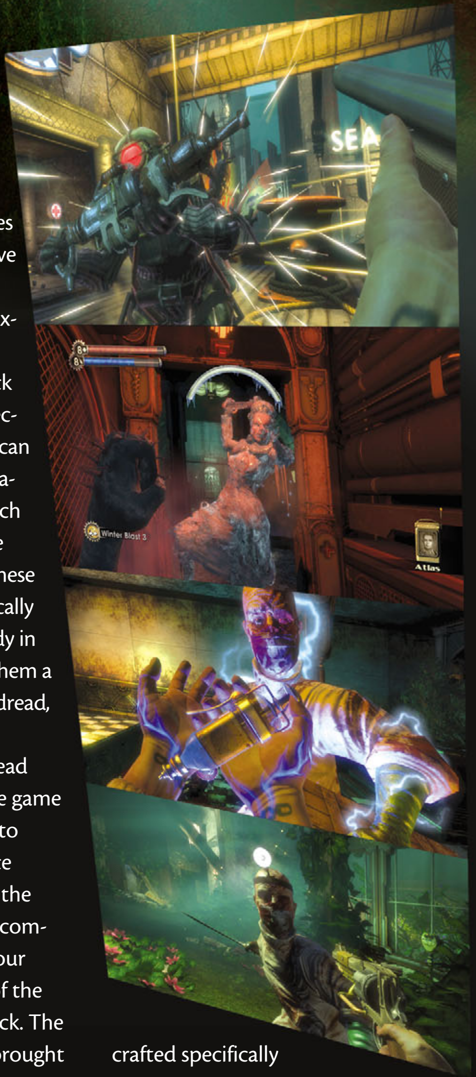
## A Terrifying Shock To The System *-by Dr. Malaprop*

$49.95 (PC-DVD); $59.95 (360) • ESRB: (M)ature • 2K Games • CultOfRapture.com

BioShock begins with your flight crash-landing in the ocean. Fuel fires blaze all around as you battle to the surface for a breath of air. The plane plummets into the watery abyss, but thankfully there's a lighthouse nearby. You swim ashore. Inside the lighthouse, you discover a transport shuttle chamber . . . but to where? With nothing left to lose, you board the minisub shuttle and sink into the depths, staring around in wonderment at the underwater structures. The transport comes to a halt, and you're gruesomely "welcomed" to the underwater city of Rapture. It's a fallen utopia where the promise of a man-made heaven has become a prison in hell.

The introduction to Rapture and the transport ride opening is one of the best we've seen since Half-Life's introduction en route to the first playable level. There's more atmosphere in this little beginning than in some entire games we've seen—and that's before the game properly starts. The art-deco architecture combined with Bobby Darin's "Beyond The Sea" bring up figments of Fallout ambiance. The storyline is deep, intriguing, and mysterious and takes about 20 hours to complete. Your character, like Half-Life's Gordon Freeman, is a silent protagonist, so the story is primarily told through audio diaries you find along the way. A nice touch is being able to listen to diary entries as you continue moving through the level. Suffice it to say that the experience of playing BioShock would be hampered by giving away more essential plot points. If you're into shooters, first-person RPGs, or general cardiac arrhythmia, then BioShock delivers on all fronts. Better yet, the game holds up in the realms of action, creep factor, storyline, pacing, character development, moral decisions, and in-game detail. Rapture feels like a real, living, breathing, decaying city of madness.

Weapons are a core element of the game. The variety of normal weapons (Tommy gun, shotgun, pistol, etc.) isn't surprising. However, the Rapture-invented genetic enhancement chemical known as a plasmid makes a big difference. There are different types of plasmids, and they can be injected into your arm to extend your prowess. A few examples: Electro Bolt lets you electrocute enemies to stun them or hack cameras and gun placements; Telekinesis lets you catch thrown projectiles and turn them against the attacker; Insect Swarm sends a swarm against the enemy. But there's so much more. The game also features tonics, which let you improve your skills (Physical, Engineering, Combat). For example, the Wrench Jockey tonic gives your melee attack more oomph. The large selection of plasmids and tonics can be used in different combinations to make the game much more replayable. You'll have ample opportunity to use these weapons against the genetically mutated freak and Big Daddy in Rapture, which bring with them a lumbering sense of weight, dread, and sadness.



Ken Levine, BioShock's lead designer, has referred to the game as the "spiritual successor" to 1999's System Shock 2. Since System Shock 2 was one of the most psychologically scary computer games ever to grace our desktops, this speaks well of the developer's work in BioShock. The induced tension is in part brought about by effective use of audio and visual cues, as well as some scripted events. There's no multiplayer mode, but the single-player is replay-friendly because of the variety of ways to play the game. The PC and Xbox 360 versions have had interfaces crafted specifically for their respective platforms by different teams. Each features a tour de force of gorgeous graphics, animation (the water is stunning), and en-vironment. BioShock is a strong contender for *CPU* mag-azine's Game Of The Year, so get it now. ▲

# MADDEN NFL 08

## Training Camp Is Over *-by Chris Trumble*

$39.99 (PC); $59.99 (X360, PS3); $49.99 (PS2, Wii)

ESRB: (E)veryone • EA Sports • www.easports.com/madden08

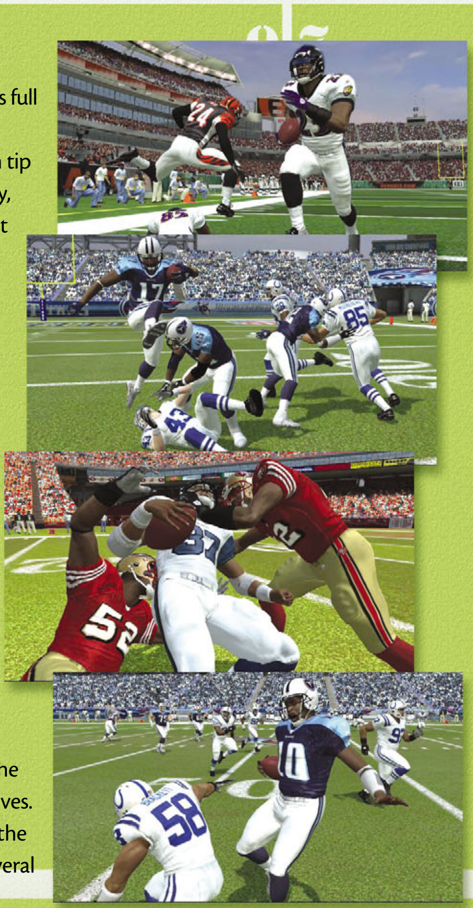
Ever since EA Sports' insanely popular Madden NFL franchise hit the current generation of consoles, people have been wondering when the publisher would kick it into gear, so to speak. Previous Xbox 360 versions of Madden have all looked pretty decent, but have often been a little skimpy in terms of features. With the newest installment, however, the EA Sports team seems to have gotten over the idea that so long as the refresh looks good, features aren't that important, at least where the console versions are concerned. In fact, depending on your take on the new Weapons feature, you might think the developers even went a little overboard in the feature department.

In NFL 08, players are marked with Weapon Ability icons that let you know what their specialties are, the idea being that this way you can use your roster to its full potential by putting your guys in roles they excel in.

Also, your opponent's Weapon Ability icons can tip you off as to what he's up to. This is OK in theory, but if you are a hardcore NFL fan to begin with, it seems like excessive hand-holding; I don't need a little tornado icon to tell me Dwight Freeney is a good pass rusher.

Otherwise, most of the feature upgrades are pretty nice. EA has expanded players' arsenal of presnap options, especially on defense, and these and other refinements make games between skilled players much more than furious button-mashing contests, which is nice. Some updates tend to widen the gulf between skilled players and novices a bit, but that's OK; getting scored on by a lucky stiff doesn't necessarily make the game more fun for the pro or the stiff.

The PC version didn't get quite as many new features as the console iterations, but of course it looks fantastic and provides updated rosters and the like, and some of the new control tweaks are positives. All things considered, Madden NFL 08 is probably the most complete update the franchise has had in several years, especially if you're a franchise mode fan. ▲



# MEDAL OF HONOR AIRBORNE™

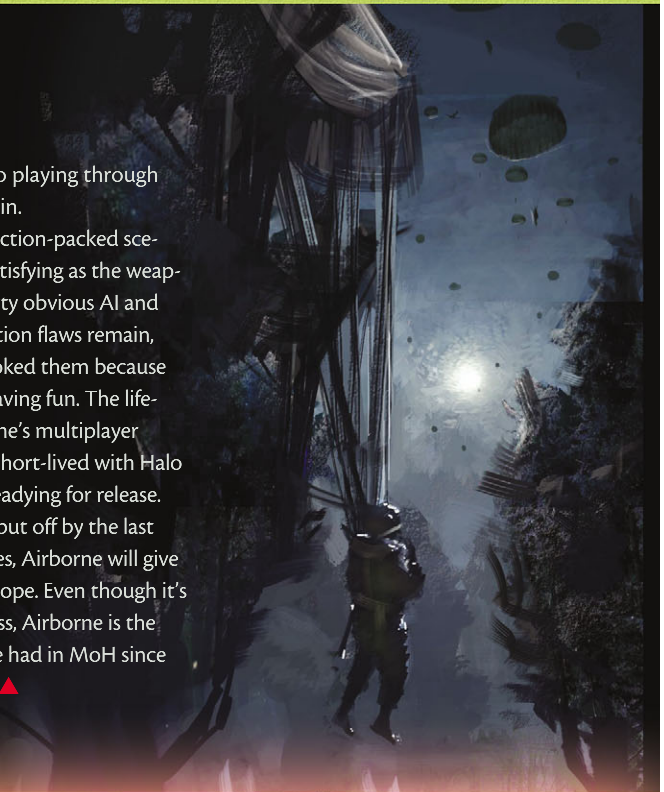
## Death From Above *-by Dr. Malaprop*

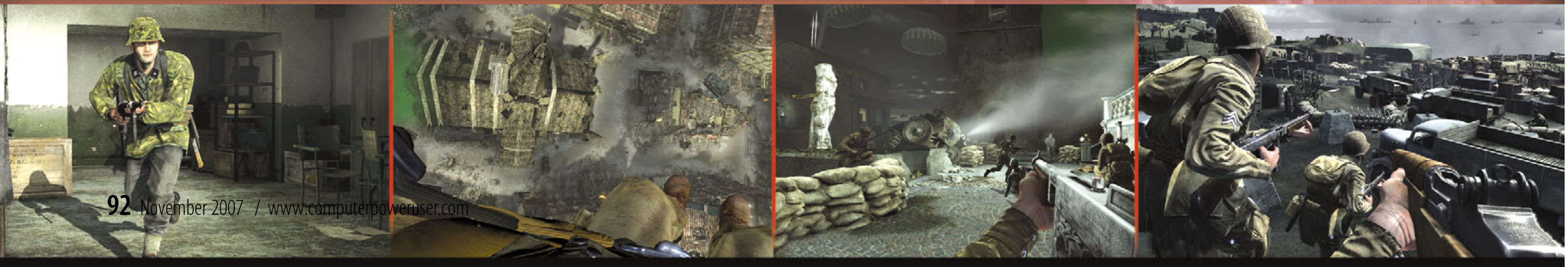
$49.99 (PC-DVD); $59.99 (360) • ESRB: (T)een

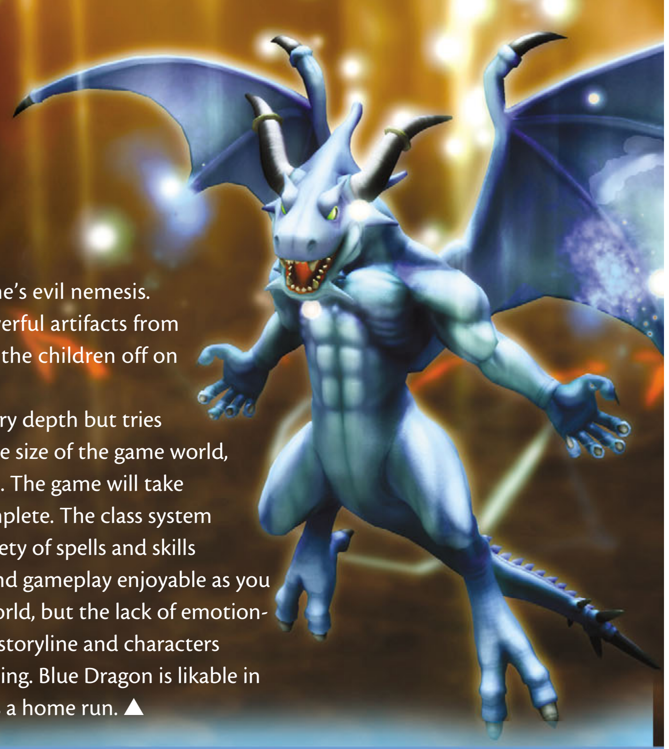
Electronic Arts • www.ea.com/moh/airborne

It's hard to get excited about playing another WWII FPS, but MoH: Airborne tries to be different by letting players parachute anywhere they wish into the war zone. As you fall to the ground, there's ample time to scope out the area and map your strategy. The safe landing zones are marked with green flares, but you are free to land where you like—it just may be harder to stay alive. The first three sprawling levels of the game are a warm-up for the next three more engaging levels. Airborne is quick to play through. Most players should easily complete the game in less than 10 hours without haste. Fortunately, the game's nonlinear nature may tempt you into playing through again. And again.

The heavy action-packed scenarios are as satisfying as the weapons. Some pretty obvious AI and collision detection flaws remain, but we overlooked them because we were still having fun. The lifespan of Airborne's multiplayer mode is likely short-lived with Halo 3 and others readying for release. If you've been put off by the last few MoH games, Airborne will give you renewed hope. Even though it's not best-in-class, Airborne is the most fun we've had in MoH since Allied Assault. ▲







# BLUE DRAGON

## Not Your Final Fantasy *-by Dr. Malaprop*

$59.99 (360) • ESRB: (T)een • Microsoft • xbox.com/bluedragonxbox360

Blue Dragon was meant to introduce the Xbox 360 to a top-notch Japanese RPG (akin to Final Fantasy, currently a PlayStation exclusive). To accomplish this, Microsoft brought Hironobu Sakaguchi of Final Fantasy fame and Akira Toriyama of Dragon Ball (for characters) on board. Both developers enjoy superstar status in the realm of Japanese RPGs. Unfortunately, this winning combination yields only slightly above-average results without the deep, epic feel found in Final Fantasy.

The story involves three children in a village terrorized annually by a flying shark. They decide to take it on and end up at the lair of the game's evil nemesis. His plans to collect powerful artifacts from all over the planet send the children off on their adventures.

Blue Dragon lacks story depth but tries to make up for this in the size of the game world, which spans three DVDs. The game will take roughly 60 hours to complete. The class system along with the huge variety of spells and skills makes overall combat and gameplay enjoyable as you delve deeper into the world, but the lack of emotional engagement with the storyline and characters proves to be a shortcoming. Blue Dragon is likable in parts but by no means is a home run. ▲

# MEDIEVAL II TOTAL WAR KINGDOMS

## Not Every Expansion Truly Lives *-by Chris Trumble*

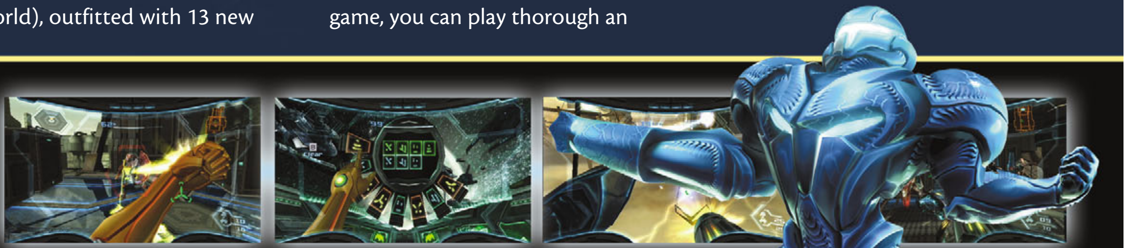
$29.99 (PC) • ESRB: (T)een • Sega • www.totalwar.com

RTS game expansions can be pretty hit-and-miss. Sometimes you merely get a new faction and a handful of new missions bolted onto an existing campaign, but sometimes an expansion goes the extra mile and breathes new life into a game you thought you'd pretty much played out. Total War fans will be pleased to hear that Kingdoms falls squarely in the latter category: it's almost like you're getting the next full game in the series for 29 bucks.

Kingdoms serves up four all-new campaigns (Britannia, Teutonic, Crusades, and New World), outfitted with 13 new factions, 50 new building types, and 110 new units. The campaigns come complete with scads of new agents, heroes, and famous historical figures, the likes of William Wallace, Richard the Lionheart, Saladin, and so on.

Multiplayer fans will also love Kingdoms' new Hotseat feature; for the first time in a Total War game, you can play thorough an entire campaign with your favorite opponent.

Best of all, this isn't just more content. It's more *really good* content, added to a game that was a heckuva lot of fun already. If you've played Total War before, you need Kingdoms yesterday, and if you haven't, this is a great time to jump on. ▲



# METROID PRIME 3 CORRUPTION

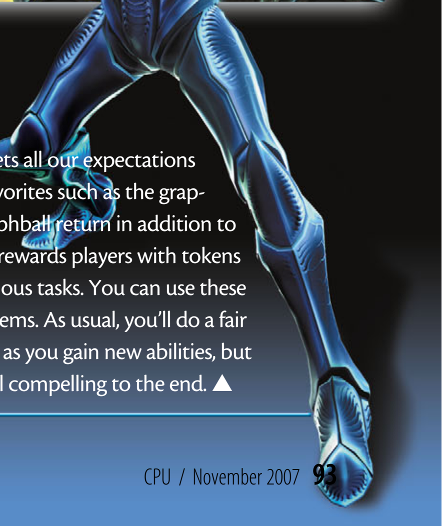
## Wii FPS Evolved *-by Dr. Malaprop*

$49.99 (Wii) • ESRB: (T)een • Nintendo • wii.nintendo.com/site/metroidprime3

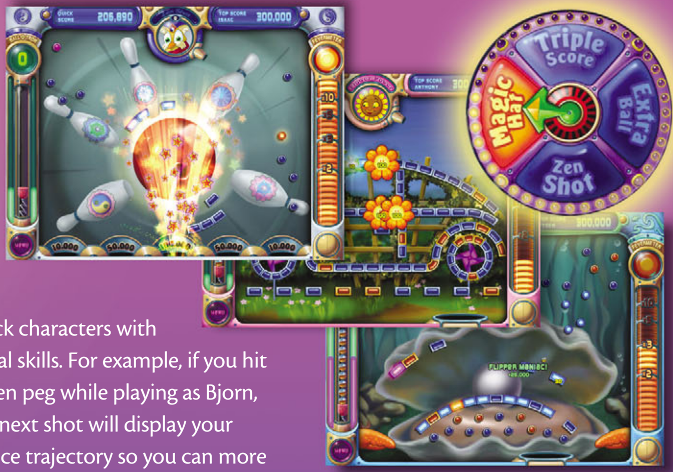
Corruption may not stand the test of time against the Xbox 360 or PS3 over the coming years, but it is one of the best-looking Wii games around and as a whole is strong enough to hold your attention through the end game. Kudos to the art style, which helps Corruption attain a level of visual elegance and atmosphere that we've not yet seen on the Wii.

As the final game in the Metroid Prime trilogy, Corruption continues with the 3D world introduced in Prime. As the enigmatic Samus, you'll investigate the viral infection of the living Aurora Unit computer in order to stave off attacking space pirates. You'll do so via an excellent Wii control scheme that should be standard issue for future Wii FPSes.

Corruption meets all our expectations and then some. Favorites such as the grapple beam and morphball return in addition to a new system that rewards players with tokens for completing various tasks. You can use these tokens to unlock items. As usual, you'll do a fair bit of backtracking as you gain new abilities, but the gameplay is still compelling to the end. ▲



# Peggle DELUXE



## Casually Addictable *-by Dr. Malaprop*

$19.95 (PC) • ESRB: (E)veryone • PopCap Games • www.popcap.com/games/peggle

www.popcap.com/games/free/peggle (Free; requires EXE download and plug-in installation)

PopCap specializes in casual games, such as Bejeweled and Zuma. Peggle's gameplay can be described as a semi-hallucinogenic combination of Pachinko and BreakOut. This is an overly simplified explanation, because Peggle's gameplay takes concepts from these titles' styles without cloning them. Attractive but simple graphics survive without widescreen support, and you can enjoy the game in a desktop window as you go about other computing activities.

Each level in Peggle features a ball-launching turret at the top of the screen, a screen of multifarious and sometimes animated pegs/bricks, and a steadily moving ball receptacle at the bottom. Play is simple: Aim your turret along a given trajectory, fire, and let gravity and physics do the rest. Players will become experts at gauging ball-bounce physics in order to meet the various play modes' objectives.

Playing through the Adventure mode will teach you the basics and unlock characters with special skills. For example, if you hit a green peg while playing as Bjorn, your next shot will display your bounce trajectory so you can more carefully plan ball placement. As Claude, your two available green peg power-ups activate a set of lobster claws that act as flippers to knock balls back up into the air. And so on. The game truly begins after you learn the basics in the Adventure mode and attempt to gain the Grand Master title by playing through 75 challenging levels. Ultimately, Peggle scores in that "just one more turn" that leads into the early morning hours. ▲

# PLAYSTATION® 3

-by Dr. Malaprop

We reviewed the original 60GB PS3 positively in the March 2007 issue of *CPU*. Things have moved quickly since then: In April, Sony discontinued the 20GB model in North America and did likewise with the 60GB in July, when it dropped the 60GB price to $500 and added an 80GB unit at the original $600 price. In late August, the company announced that its warehouses had shipped all remaining 60GB hardware into the retail channel, so once those sell out in stores, your only choice will be the 80GB version, unless a new, lower-end model is introduced.

One significant change to the new 80GB unit: Sony lowered manufacturing costs by removing the EE (Emotion Engine) processor hardware (among other ongoing manufacturing cost efficiencies). The EE chip brought more reliable PS1 and PS2 hardware-based backward compatibility to the PS3. This is significant for gamers with large pre-PS3 game libraries. Concerned parties can review game compatibility at www.us.playstation.com/Support/CompatibleStatus. Otherwise, there's nothing else that's significantly different with the new 80GB model.

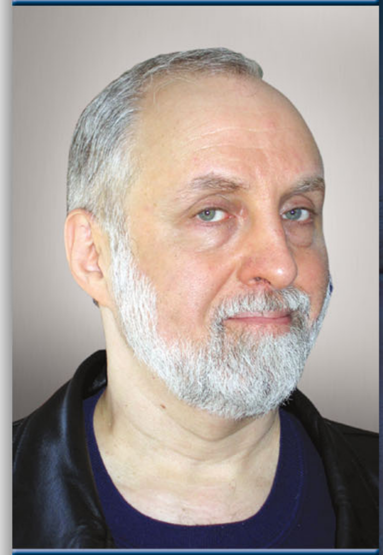
At press time, you would be paying $100 more than the 60GB for an extra 20GB of storage and a year-old PS3 game (MotorStorm). Irritatingly, you're also *still* required to purchase your HDMI or component cables separately. That 20GB is less significant because it's an easy DIY HD replacement job (directions: www.overclock.net/playstation/184994-how-ps3-hard-drive-swap.html). Our original review noted that the PS3 has great potential but didn't offer compelling games. This may change in 2008 with potential PS3-exclusives such as Metal Gear Solid 4 and Gran Turismo 5. Blu-ray edging ahead in the ongoing HD movie format war could also factor in. Ultimately, our recommendation is to snap up the 60GB package if you've already decided on purchasing a PS3 in the near future. ▲

$599.99 / CPU Rating: ●●●◐

Sony Computer Entertainment / www.us.playstation.com/PS3

# Before The Web, There Was . . . The BBS

by Barry Brenesal



*Barry Brenesal has written more than 1,000 published articles and reviews on electronic technology since 1987. His first personal computer was a Radio Shack TRS-80 model 100. It was last seen functioning as a boat anchor.*

I left public radio management for writing in 1987 and quickly discovered that my magazine editors had embraced networking. Since I needed to send features and reviews to them online, we needed a modem.

"Why don't we buy a 2,400-baud?" my wife asked.

"Nah," I said, after considering it for a minute. "1,200 is enough; we'll never need more for anything."

There you have it: my single most embarrassing Luddite moment. Of course, we ended up moving to 2,400-baud very soon after that. I quickly discovered a new use for that modem: the bulletin board system, or BBS.

The first BBS debuted in the winter of 1978. Trained as a physicist and a mainframe programmer by profession, Ward Christensen was speaking by phone with his friend, Randy Suess. Hayes had just released the Hayes MicroModem 100, and when the conversation touched upon the especially snowy, frigid conditions of Chicago's winter wonderland, the pair decided to create code and hardware that would place a computer on a phone line. The idea was for people to call in and leave messages just as they would on a real-world bulletin board, the difference being that that people could respond more easily to virtual bulletin boards, since visiting them was no more than a phone call away.

(Before we get too far along, we should acknowledge a predecessor to the BBS: ARPANET, the Advanced Research Projects Agency Network of the U.S. Department of Defense. It is credited with being the world's first packet-switching network, a concept that would become basic to both the BBS and the Web. But ARPANET was primarily an email network, and always governmental. Christensen and Suess did something different. They created a virtual space for discussion and a sense of shared community among those who, for whatever reason, found such things lacking in real life.)

That first board, called CBBS, was miniscule by modern standards. It was stored on an 8-inch 173KB floppy diskette, connected to callers via a 300bps modem, and ran on 64KB of RAM. But it was as good as good got at the time, and it certainly attracted a world of attention in late 1978 when Christensen and Suess wrote an article about it for *Byte* magazine. The word was out, and soon bulletin boards began appearing everywhere. Early boards were primarily message centers for open discussion, private email, and the sharing of files, with their code displayed on the screen in ASCII to be retyped and saved.

The BBS' popularity grew swiftly; by 1980, Christensen was reporting 11,000 users on CBBS. Then how little Topsy did grow! The advent of Xmodem meant support for file uploads and downloads. This led to the creation of BBS file libraries, including such things as applications and images. Within a few years, online games were added to bulletin boards, as well, as were voting booths. BBS networks were formed, passing along and receiving information packets. The most impressive of these, FidoNet, let people participate in international discussions, but there were numerous others. Some served specific purposes, such as hosting flea markets, academic study groups, and religious fraternities. A network for Boy Scouts in Italy, called ScoutNet, appeared in the early 1990s; it was soon copied elsewhere and became a link in a chain. That was the way the BBS developed.

The way it died was simple: The Internet came along with far greater resources and a truly graphical interface. A few BBSes remain, usually accessible by Telnet. You can find a typical list at www.dmine.com/telnet/brieflist.htm.

And while we're visiting the dawn of the Web, let's dispel one particularly persistent myth: Al Gore never said he invented the Internet. As a U.S. senator during the 1980s, Gore was a prominent advocate for high-speed national networking capabilities. The rest was money trying to create reality in order to damage a presidential candidate. So here's a quick tip of the hat to this man who helped make the Web possible, along with many other farsighted individuals. And a sweeping bow to a few techno-geeks who were the pioneers in developing the ideas and technologies that drew us all together, first on the BBS and then on the World Wide Web. ▲

Wax nostalgic with Barry at barry@cpumag.com

I quickly discovered a new use for that modem: the bulletin board system, or BBS.

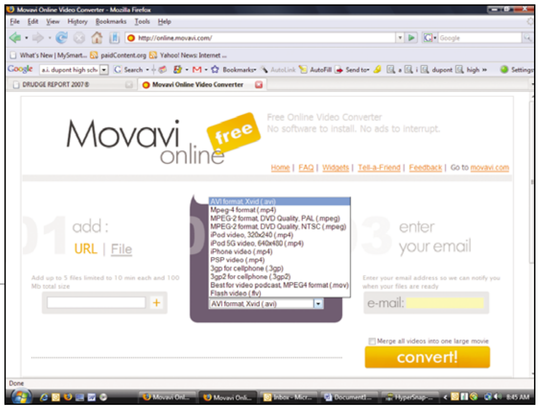
# Software Tips & Projects

## Make Your Own YouTube DVD, Part 2

Online video grab services continue to crop up online, so before we get to the DVD creation part of our YouTube project, we'll cover a couple of other options that now are available.

As a promotion for its $29.95 Movavi video suite of conversion and burning tools, Movavi Online at online.movavi.com will convert batches of embedded videos into a wide range of formats. Most of the grabbing services we reviewed in the last issue let you download a Flash video file into its native FLV format, which means that you must convert it again to a more common MPEG or other format for playback on the Desktop. The Movavi service converts in background to AVI, MP4, and even 3gp for mobile phones.

Go to the Movavi Online site and paste in the URL of your online video, then hit the plus (+) button to add it to your queue. Choose an output format from the drop-down menu and then enter your email address. Movavi contacts you via email when the conversion is over and a download link brings you to the files. We tried the MPEG-2 format for NTSC video, which produced good results. Keep in mind that there is a size limit for the service, so you can only do smaller batch jobs. We were impressed by the end results when we got them, but Movavi did not successfully convert some files and we experienced some lip sync problems on longer clips.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iPod 5G video, 640x480 (.mp4)
iPhone video (.mp4)
PSP video (.mp4)
3gp for cellphone (.3gp)
3gp2 for cellphone (.3gp2)
Best for video podcast, MPEG4 format (.mov)
Flash video (.flv)
AVI format, Xvid (.avi)
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convert!
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Free Online Video Converter
No software to install. No ads to interrupt.

Add up to 5 files limited to 10 min each and 100 Mb total size

Enter your email address so we can notify you when your files are ready

The new and free Movavi service converts online video into any of a number of video formats.

The lip sync issue can attack any converted video. One piece of advice is to check the full length of your converted video before committing it to the DVD project. Audio syncing with video is one of the first things video conversion gets wrong. If you are having sync issues, try reconverting the video into a different format. Also, try using a different online service (as outlined in the first installment of this project last issue).

### Vista's Down & Dirty DVD

If you have Vista, you can design and burn DVDs. Go to the Start search box and enter **Windows DVD Maker** to bring up that program. This DVD maker is hobbled by training wheels, but if you don't want the expense of additional editing software, it's the cheapest game in town. In the first screen, simply drag and drop video files into the Add Pictures And Video window. You can use the arrow buttons to change the order of the videos. In the text box on the bottom of the window, the name you enter for your disc will become the DVD menu's title.

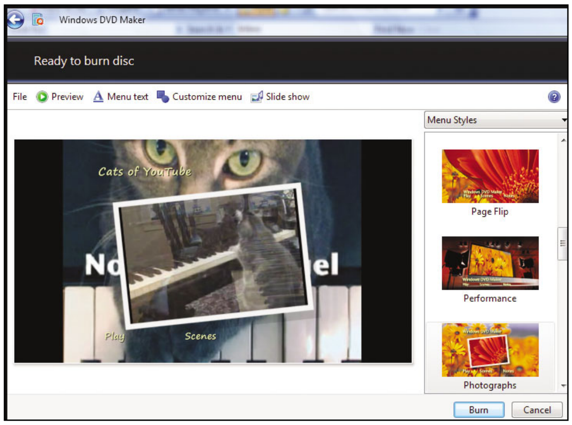
If you are giving this disc to truly tech-averse relatives who have trouble navigating DVD menus (oh, we have some in our family), then you may want the disc to autoplay when the user inserts it in his player. Click the Options text button in the Add Pictures window and toggle the Play Video And End With DVD Menu option.

### WinXP Tip Of The Month

If you're a programmer who flips between the standard Desktop in Vista and a command window, there is an easy shortcut. From Explorer, you can open a command box into any folder. Simply right-click the folder while depressing the SHIFT key. This adds an Open Command Window Here option to your context menu. Clicking it opens the command window within the targeted folder.

### Registry Tweak Of The Month

System Administrators looking to restrict staffers from fiddling with their new Vista Desktops have to learn a whole new bag of tricks. One of the handiest and most efficient is simply blocking access to the Control Panel altogether. Open Regedit and navigate to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer. Right-click to make a new DWORD and name it NoControl Panel. Double-click this new Value and give it a Value Data setting of 1. The effect will be immediate. Any attempt to access the Control Panel from the Start menu will produce a restriction notice. Keep in mind that knowledgeable users can still find their way to the Control Panel through other means. With this tweak turned on, we couldn't open the Control Panel from its item on the Start menu or when it came up in a program search in the Start window. On the other hand, we could still open the Control Panel from the Folders pane in the Computer window.



Vista's built-in DVD Maker does not give a YouTube ripper much in the way of video enhancements, but it is quick, easy, and free.

Click Next. This is about the only opportunity you have to customize anything in the Vista DVD program. As you see, you can choose a menu style. Highlighting any of them gives you a preview of that style in the main window. Choose the basic menu structure before trying any of the customization options. Use the Menu Text button to access text labels for the disc title, as well as the Play and Scenes buttons. You can also add another menu item here for Notes, which will click into a text message you can make for the recipient (perhaps a birthday greeting or joke, etc). Make changes here and click Change Text. You can also use the Customize Menu button to change the default video that plays in the opening screen (Foreground video) and behind the DVD button icons on the scene selection screen (Background video). You can also add an MP3 as audio background for the main menu.

Once all of your options are set, clicking Burn will encode and write the disc to the media in your drive.

## Cleaning & Primping The Video

Because YouTube and other embedded video is low-res material that is being encoded and converted multiple times before it reaches your DVD, you may want to use a more advanced DVD editor that can enhance and alter the image quality in different ways.

We will use Roxio's Nero Vision (part of the Ultra 7 Enhanced suite) to demonstrate a tweak or two that is applicable in most intermediate editors. Upon starting a new project, you simply drag and drop the converted online video we made earlier into the Content window. Click the Edit Movie button to open the editing deck, which is where you can sculpt your project. Rather than give a tutorial in DVD-making here, we will highlight the tools that help poor online video look a bit better on your TV.

Assemble your clips in order on the Storyboard at the bottom of the editor. Now, click the Timeline tab above the storyboard to open up more advanced tools. In the upper right (above the video file library), click the Display Video Effects tab and use the drop-down menu to bring up the Sharpness tools. Try double-clicking Enhance Details or Enhance Focus and you will see it appear in the Effects track of the Timeline. To apply the effect to the whole clip, highlight the effect on the Timeline and drag the right edge to the end of the clip. If you want to apply the effect to all the videos on the disc, double-click on the effect in the Timeline and set the Duration counter to match or slightly exceed the full running time of your video. The bottommost track on the Timeline shows you how long the full Timeline is taking. Then you can make menus and complete your DVD in the usual way.

## Going Pro

If you have access to a dedicated and higher end DVD editor such as Pinnacle Studio Plus, then there is a range of image enhancement tools available to ambitious YouTube rippers. For instance, in Pinnacle, once you have loaded your clips into the library, use the Storyboard view in the main editing bay to arrange your videos into the sequence you like. Highlight a clip and use the Toolbox menu to open Add Video Effects. Like most advanced editors, Pinnacle lets you layer enhancement effects such as color correction and image sharpening. In the Effects window, we double-clicked a Sharpen effect that we could add to the list of applied effects and then adjusted for intensity. Pinnacle actually shows you in real-time how the slider affects the prominence of edges in the video. You can also layer multiple effects onto a clip. Like the Enhance Detail effect in Nero, the Sharpen tool in DVD editors can add a more prominent outline to image details to make them appear sharper on a larger screen. We also used the Color Correction effect and tinkered with the Brightness slider to bring up detail in the homemade clip that is in shadows in the standard rendering. If you want to apply the chosen effects to more than one clip in your storyboard, then you must hold the CTRL key and click each clip before applying the effects.

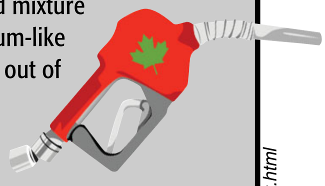
The old GIGO formula (Garbage In, Garbage Out) does not necessarily apply when it comes to digital video. Even with low-res homemade material such as embedded Flash clips, there are ways of making a YouTube video just a bit more palatable on your living room screen. ▲

**by Steve Smith**

## Infinite Loop

### West, 1: Opec, 0

In a move that could go a long way toward fostering U.S. energy independence, a California-based company called Amyris Biotechnologies has created a new way to make fuel from organic substances. Set to hit the market in three to five years, this new technology uses genetics to transform a sugary liquid mixture into a petroleum-like mix that, right out of the box, could be run through existing pipelines, gas stations and, automotive engines, with no retro-fitting necessary. The company's goal is to come up with a competitively priced ($45 per barrel) product that will literally and figuratively put OPEC "over a barrel."



www.amyrisbiotech.com/contact.html

# Warm Up To Penguins

## The Down & Dirty Details Of Linux Network Configuration

Most recent distributions of Linux will do everything but shine your shoes when it comes to Linux network configuration. If you're on a network with a DHCP server, your newly minted Linux system should come up already talking to the Internet and ready to party. And when you do need to make a manual change, GUI-based tools hold your hand and make sure you don't stub your toe.

Well, that's not how a pro configures a network. Leave those namby-pamby tools where they belong, in a child's toy box. Real geeks configure their networks from a console prompt. Blindfolded!

In all seriousness, there are situations when you need to punt the user-friendly GUIs and poke at your network from the command line. For one thing, the GUI doesn't show you all the information available about your Ethernet interfaces, nor does it allow you to set all the options. And GUI tools won't help you when you're trying to administer your system remotely via SSH. In this series, we'll take a look at the command-line networking tools that should be in your arsenal. Also, before we dive in, just a quick point of reference: In our illustrations, we'll be using a system with a broadband connection; dial-up requires a totally different set of tools.

### Health Checks

If you've had a broadband connection for any appreciable amount of time, you've had to deal with a dropped connection. Let's say that you aren't able to open Web pages in Firefox. To start, you'd probably try seeing if you can communicate with your local router. Let's say that your Linux system's local IP is on 192.168.1.178 and your router's is 192.168.1.1.

The Ping command is your first friend. There are three possible things you could see when you try to ping the router. If your Ethernet interface is screwed up, you'll see something like this:

```
turner@ubuntu:~$ ping 192.168.1.1
connect: Network is unreachable
```

This tells you that there's no way that the system can find to talk to the 192.168.1.x network at all. In this case, you're going to need to use **ifconfig** and **route** to solve the problem, which we'll discuss later. You're more likely to see something like this:

```
turner@ubuntu:~$ ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1)
56(84) bytes of data.
From 192.168.1.178 icmp_seq=1
Destination Host Unreachable From
192.168.1.178 icmp_seq=2 Destination
Host Unreachable From 192.168.1.178
icmp_seq=3 Destination Host
Unreachable
—- 192.168.1.1 ping statistics —-
5 packets transmitted, 0 received, +3
errors, 100% packet loss, time 4009ms,
pipe 3
```

Your system will keep trying the Ping command until you press CTRL-C, which we did after three failed pings. The important things to see here are the error (Destination Host Unreachable) and the statistics at the bottom (100% packet loss). What this tells us is that our system sent the packets out over the network but never received a reply. This can mean any of the following: The local system's network interface is bad; the network cable isn't plugged in; there's a problem somewhere farther down in the wiring; or that the router itself is hosed (to use a technical term).

The third possibility is that you'll see something akin to this:

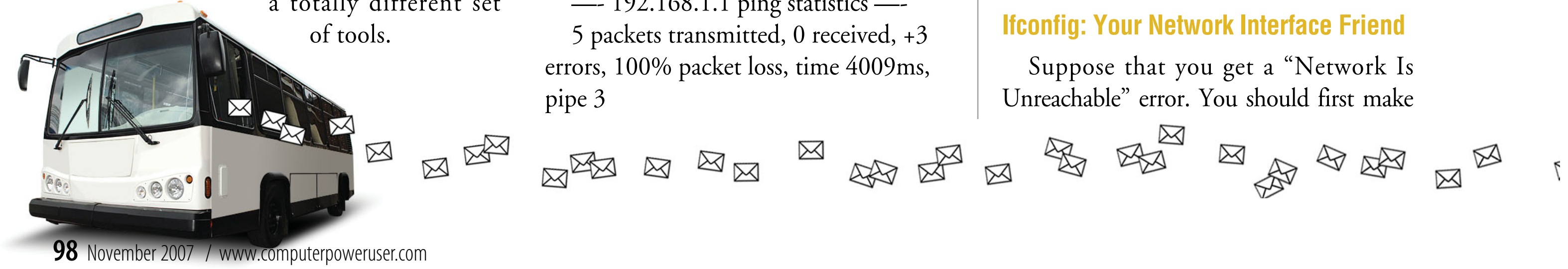
```
turner@ubuntu:~$ ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1)
56(84) bytes of data.
64 bytes from 192.168.1.1:
icmp_seq=1 ttl=127 time=6.67 ms
64 bytes from 192.168.1.1:
icmp_seq=2 ttl=127 time=0.772 ms
64 bytes from 192.168.1.1:
icmp_seq=3 ttl=127 time=0.577 ms
64 bytes from 192.168.1.1:
icmp_seq=4 ttl=127 time=0.572 ms
64 bytes from 192.168.1.1:
icmp_seq=5 ttl=127 time=0.829 ms

—- 192.168.1.1 ping statistics —-
5 packets transmitted, 5 received, 0%
packet loss, time 4017ms rtt
min/avg/max/mdev =
0.572/1.884/6.674/2.397 ms
```

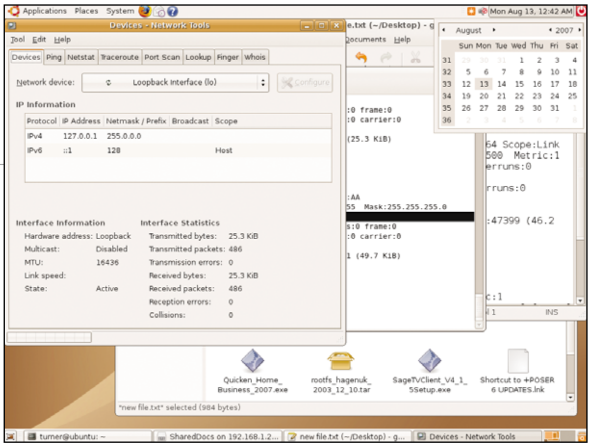
Here, the packets were being received and echoed back. The only really useful number other than the 0% packet loss is the "time=" figure, which also appears in among the ping statistics. This tells you how long it took for the packet to reach the other device and return, which, in our case, was around 0.7 milliseconds in this case (discounting the first packet, which can take a bit longer). This is the kind of response you'd expect from a local network; when talking to hosts across the world, things can become quite a bit slower, as we'll see.

### Ifconfig: Your Network Interface Friend

Suppose that you get a "Network Is Unreachable" error. You should first make



Most of the time, you should use a GUI-based network configuration tool if you can.


Applications Places System
Mon Aug 13, 12:42 AM
Devices - Network Tools
Tool Edit Help
Devices Ping Netstat Traceroute Port Scan Lookup Finger Whois
Configure
e.txt (~/Desktop) - g
Documents Help
August 2007
Quicken_Home_Business_2007.exe
rootfs_hagenuk_2003_12_10.tar
SageTVClient_V4_1_5Setup.exe
Shortcut to +POSER 6 UPDATES.lnk
"new file.txt" selected (984 bytes)
turner@ubuntu: ~
SharedDocs on 192.168.1.2...
new file.txt (~/Desktop) - g...
Devices - Network Tools

Network device: Loopback Interface (lo)

IP Information

| Protocol | IP Address | Netmask / Prefix | Broadcast | Scope |
|---|---|---|---|---|
| IPv4 | 127.0.0.1 | 255.0.0.0 | | |
| IPv6 | ::1 | 128 | | Host |

Interface Information

Hardware address: Loopback
Multicast: Disabled
MTU: 16436
Link speed:
State: Active

Interface Statistics

Transmitted bytes: 25.3 KiB
Transmitted packets: 486
Transmission errors: 0
Received bytes: 25.3 KiB
Received packets: 486
Reception errors: 0
Collisions: 0

sure that you have a properly configured Ethernet interface. The command you use for this is **ifconfig**, which stands for interface configurator. The ifconfig output for a properly configured system might look something like this:

```
   turner@ubuntu:~$ ifconfig
   eth0  Link encap:Ethernet HWaddr
00:0C:29:E7:41:AA
      inet addr:192.168.1.178
Bcast:192.168.1.255
Mask:255.255.255.0
   inet6 addr: fe80::20c:29ff:fee7:41aa/64
Scope:Link
      UP BROADCAST RUNNING
MULTICAST MTU:1500 Metric:1
      RX packets:1660 errors:0 dropped:0
overruns:0 frame:0
      TX packets:520 errors:0 dropped:0
overruns:0 carrier:0
      collisions:0 txqueuelen:1000
      RX bytes:487892 (476.4 KiB) TX
bytes:47399 (46.2 KiB)
      Interrupt:177 Base address:0x1400

   lo  Link encap:Local Loopback
      inet addr:127.0.0.1 Mask:255.0.0.0
      inet6 addr: ::1/128 Scope:Host
      UP LOOPBACK RUNNING
MTU:16436 Metric:1
      RX packets:486 errors:0 dropped:0
overruns:0 frame:0
      TX packets:486 errors:0 dropped:0
overruns:0 carrier:0
      collisions:0 txqueuelen:0
      RX bytes:25912 (25.3 KiB) TX
bytes:25912 (25.3 KiB)
```

You can see two network interfaces here. The "lo" interface is the loopback interface; it lets your system send and receive data to itself using the address 127.0.0.1. The "eth0" interface has the job of communicating with your local network. Let's look at the useful information we can extract from it.

The HWaddr field is the Ethernet address (not the IP address) of the interface adapter. Every Ethernet interface device in the world should have a unique Ethernet hardware address. Sometimes a router needs to know this data, especially if you want to configure the router's DHCP server to always give your system the same IP address, normally done on private subnets.

The next line tells you all about the local IP address assigned to this system. The really important one is the first section, which tells us that this system is configured to use the address 192.168.1.178. The remainder of the line gives you the broadcast address and subnet mask for the interface. For example, a class C subnet would have a broadcast address of 192.168.1.0 and a network mask of 255.255.255.0 (meaning that the first 24 bits of the address are used for determining the subnet, and the last 8 specify the address on the subnet).

The only other thing that you should look for is the word "UP," two lines down. It tells us that the network interface is up and running. If you don't see this, you can try starting the interface manually by typing **sudo ifconfig eth0 up**. If the command returns no output, it worked. It may also tell you that it can't find the interface; in this case, you have a hardware problem. Looking in /var/log/syslog or typing **dmesg** at the console may give you some further information as to why it failed.

You can even do things like change your IP address. Typing **sudo ifconfig eth0 192.168.1.179 up** would change our local IP address from 192.168.1.179.

Note that you have to run the command as root (either by logging into the root account or by using sudo) to change an Ethernet interface, although you can ask for information as any user.

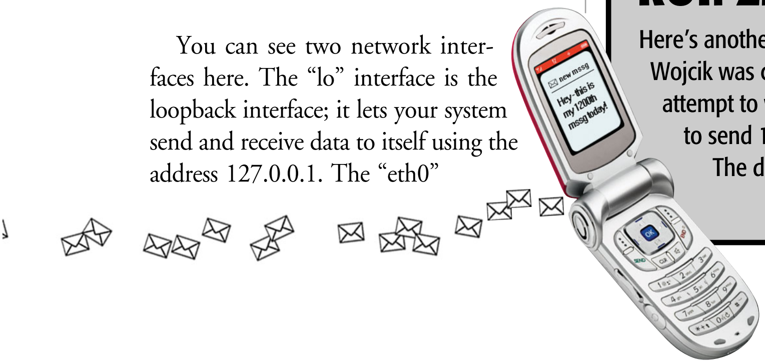
Let's assume that you can successfully ping all the way to your router.

That leaves only a few reasons that your network could be down. Either some connection farther along is dead (such as between your ISP and the greater Internet), your DNS could be improperly configured, or your routing table could be wrong.

## Next Steps

So what do you do if your network interface looks OK and you can ping your router, but you still can't access the Internet? In the next column, we'll look at some tools (traceroute, dig, and route) and a few files that can help you diagnose more complicated problems. We'll also cover how you can make your fixes permanent. And in the final part of this series, you'll get a peek at configuring an open-source wireless network. Until then, happy pinging! ▲

**by James Turner**


new msg
Hey-this is my 1200th msg today!

## Infinite Loop

### ROI: Zilch

Here's another example of negligence clashing with technology. Polish bus driver Leszek Wojcik was canned after he sent 38,000 text messages on a company cell phone in an attempt to win a $36,000 prize. Things might have been OK if he had had permission to send 1,200 messages per day, instead of the 6 which he was actually allotted. The driver's comment regarding his fate: "Now I'm without work."

*Source: cnews.canoe.ca/CNEWS/WeirdNews/2007/07/27/4373364-ap.html*

## Shavings From The Rumour Mill

by Mike Magee

# Graphics Card Market Needs Intel Shakeout

It's time Nvidia and AMD got a good kicking on the graphics card front, and the word on the street is that Intel's Larrabee GFX will give them a run for their money. And save *us* money.

Yeah, I know that Intel is positioning Larrabee as a competitor to AMD's Fusion, but the latter isn't going to be around until 2009, and graphics products from the chip senior will be out far sooner than that. Forget the co-processor model for a while.

Leadtek recently released its "Leviathan" board, and my ticker was set racing by the fact this thing sells for a staggering $900.

We all want to have the fastest thing on the block, but if there's something I'll remember 2007 for, it's that high-end cards promising top performance and costing a fortune haven't really provided much better performance.

Performance is a relative thing, as all *CPU* readers know, but laying out $900 on a graphics card really takes the biscuit. As usual, hardware leads software (a repetitive theme in this column of mine), and I'm hoping Intel will bust what seems a little bit like a cartel very soon now.

There's evidence that Intel is very, very serious about giving AMD and Nvidia a taste of their own medicine. The company acquired top guys from 3D Labs, and the word on the graphics card strasse is that Intel is rushing to bring graphics products out.

AMD (ATI) and Nvidia appear to be making hay while the sun shines because the other word on the street is there's a very big shortage of graphics processing units—their partners, the add-in board makers (AIBs), are shrieking for chips to satisfy demand.

It can't be a pent-up demand because most people I know are still holding fire on Vista. But as we all know from January 2008, Windows XP will not be an option unless Microsoft changes its mind on the cutoff date.

There are arguments for and against Intel entering the graphics market, and they're well rehearsed. It's a fact that Intel's past attempts to create discrete graphics products haven't done particularly well, nor have they been noted for their fantastic performance. Their integrated products with chipsets still rule the roost—Intel seems to have more ins with notebook and desktop manufacturers on the graphics front than the whole world and its herd of dogs. But presumably Intel learns from its mistakes, and it certainly can't have Nvidia and AMD (ATI) thumbing their noses at the great chip giant. That's the downside.

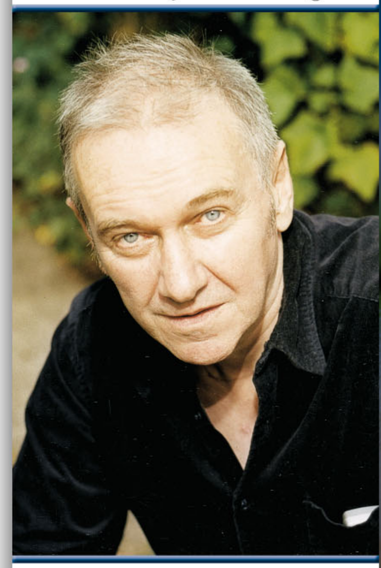
There's definitely an upside. Intel has a track record in busting open markets, and this has usually benefited customers. There was a time, for instance, when vendors would try to sell you a network interface card for quite a substantial amount of money; Intel put paid to that by building NIC functionality into motherboards. And just 10 years ago, Sun Microsystems was the master of the workstation market, but Intel (which used Sun workstations to develop its 486 microprocessors, by the way) nixed that exclusivity, saving everyone scads of money in the process.

Intel is sometimes regarded as a monopolist, and while there may be some merit to that charge, its very aggressive strategy of large-scale integration has simply caused many a firm to scuttle speedily to find a different market to play in. In some cases, the competition for market share has been much tougher; Intel has been struggling with the mainframe guys for a dozen years, and IBM and the others still have the upper hand there.

But the company's true realm is the PC—where Microsoft plays well, too—and it is a very proud player there. AMD acquiring ATI was a slap in the face to Intel, and it's no secret that behind the curtain, Nvidia is an affront to the chip giant, as well.

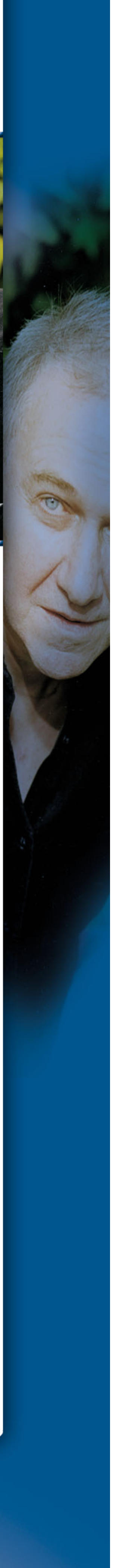
Further, unlike little AMD, Intel continues to have vast amounts of cash in the bank to launch against the graphics companies, and we have no doubt at all that this will occur sooner rather than later. $800 for a graphics card? In a year's time, we will likely be paying a quarter or a fifth of that. ▲

Send rumours to "Mad Mike" Magee at mike@cpumag.com.



*Mike Magee is an industry veteran. He cut his teeth on ancient products like the Dragon and the Japanese PC platforms long before the IBM-PC won. He worked for a corporate reseller in the mid-'80s and saw the Compaq 386 sandwich box and every GUI known to humankind. Mike decided that the way to go was the Interweb around 1994 after editing PC mags in the late '80s and '90s. A co-founder of The Register, Mike started the chip-driven INQUIRER (www.theinquirer.net) in 2001. He has contacts from top to bottom in the business, spanning the entire chain, who help him root out interesting rumours and speculation.*

It's time Nvidia and AMD got a good kicking on the graphics card front . . .



## Wagging The Dog

# We Are The Creators Of Our Own Innovation

by Rahul Sood

Over the years, I have enjoyed watching how the competitive landscape in our industry has changed based on various dynamics and customer needs. We have seen consolidation in some segments, and certain companies have vanished into thin air. We have also seen small, new companies become giants in very little time, including Apple, which at one point was in some rather dire straits and now has a market cap that is much higher than a certain company that doubted them a decade ago. (Hint: this company *used to be* the No.1 PC maker.)

If there's anything I've learned in this business, it's that consumers are much smarter than they used to be. In the case of the consumer electronics industry, there is a noticeable difference between the technical knowledge exhibited by today's consumer and that of five years ago.

Take, for instance, TVs. I remember a time when walking into a Sony store was like a walk into the future, but these days it's like a blast from the past. In the past, shoppers often largely based their buying decisions on which brands they trusted, but now we see customers basing their decisions on their technological needs and wants. Sony's executives got a little too comfortable with the power of their own brand, assuming that it would carry the company forward no matter what the competition had to offer—boy, were they wrong! Looking at some of the offerings from Pioneer, Sharp, Samsung, and HP, it seems obvious that the TV market is highly competitive, and only companies who truly understand their customers will know what to do in order to grow their business. Brand is important, but it's not sustainable unless you continually revisit your brand promise and make adjustments as the market demands them.

As more vendors jump into the PC market, more commoditization takes place. Instead of focusing on the customer, they are focused on "speeds and feeds," and instead of working to differentiate their products, they depend on partner companies like ATI, AMD, Intel, Microsoft, and Nvidia to innovate for them. The end result of that is what you see in stores every day: rows and rows of boxes with "sticker marketing" and price tags. Sticker marketing is when retail PCs come festooned with branding stickers from Microsoft, ATI, Nvidia, Intel, and AMD.

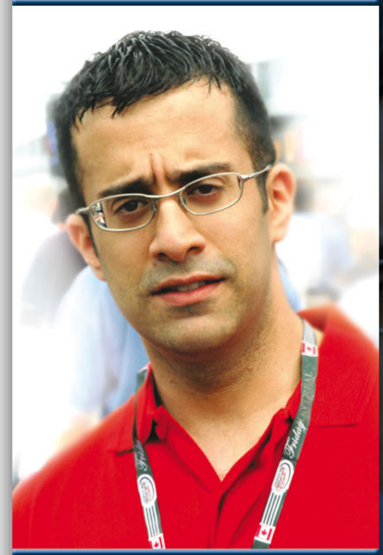
I understand the purpose of sticker marketing; it helps send dollars back to OEMs so they can offer lower prices and be more attractive at retail. But I believe in the end these programs are actually a disservice both to consumers and to the companies that participate in them. Sticker marketing promotes commoditization and devalues innovation from an OEM standpoint. Instead of focusing on such programs, component companies should probably think about working with OEMs on cool platform innovations so PC buyers can benefit from them.

Don't get me wrong, these partners are key to our industry, but it's unfortunate that we depend on these "enablers of innovation" to become "creators of innovation." After all, these companies are not as intimate with our customers as we are; working with people who buy our products on a daily basis puts OEMs in the best position to know what they really need.

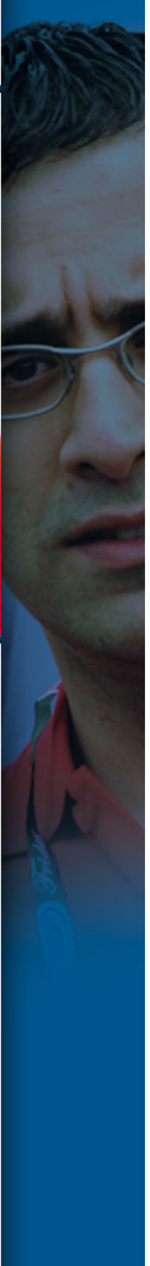
Things seem somewhat dire in certain segments of the market. People are shifting from desktops to notebooks for reasons that have little to do with specs. The best many companies can do to differentiate is to offer higher levels of service or faster shipping, but still something is missing; perhaps the total experience.

I believe, as do many of my colleagues, that the desktop space has tons of room for growth. People talk about "customer experience" without actually thinking about what it means. By simply asking 20 of your customers what they want, studying their habits, and understanding what people complain about, you'll soon start to remove the clouds that hamper innovation. I also believe that the notebook market will continue to be a major growth segment, but that shouldn't come at the expense of desktops.

If you're a regular visitor to this page, you'll probably see that this all ties together. The PC industry isn't where it should be today as a whole, but there are small pockets of change at work today, and we're glad to have been a part of affecting such change. ▲



*Rahul Sood's love for computers started at the young age of 11. Much to the shock and dismay of his parents, he ripped apart his brand-new Apple //c and painted it red before turning it on. His parents' dreams of having a doctor for a son were shattered when college drop-out Rahul founded what is now one of the most respected high-end computer companies in the world, Voodoo Computers.*



> . . . I believe in the end these programs are actually a disservice both to consumers and to the companies that participate in them.

Send your opinions to this opinionated guy at rahul@cpumag.com.

CPU

# Look For *CPU* At These LAN Parties Across The Nation!

### 09.27.07
Appalachian State University Gaming Club, Boone, NC
Info: http://www.gaming.appstate.edu

### 09.28.07
FragFest 2007, Utica, NY
Info: http://www.fragfest.com/index.cfm

### 09.29.07
East Coast LAN,Chesapeake, VA
Info: http://www.eastcoastlan.com/index.php

Halo3 Release Party, Aubrun, WA
Info: http://teccomputer.com

### 10.06.07
{CKC} ToTaL KHaoZ 2007, Plymouth, MI
Info: http:// www.theckcclan.com

### 10.06.07
L7 LAN, Windom, MN
Web site coming soon!

### 10.13.07
Arkansas LAN, Hot Springs, AR
Info: http://www.arkansaslan.com

Nashville LAN, Nashville, TN
Info: http://www.nashvillelan.com

Whempy's LAN Party, Columbus, OH
Info: http://www.whempys.com

WNY Gamers Club, Hamburg, NY
Info: http://www.wnygamersclub.com

### 10.19.07
Chibi-Pa LAN Party, Trenton, FL
Info: http://www.seads.org

Phoenix Gaming Fall Fragathon 2007, Kenosha, WI
Info: http://www.phoenixgaming.net/index.php

### 10.20.07
Abattoir.net, Oakville, ON, Canada
Info: http://www.abattoir.net/minutes.htm

Protocol 42, Salt Lake City, UT
Info: http://www.protocol42.com

WLP Fall LAN, Wichita, KS
Info: http://wichitalan.com
/index.php?option=com_frontpage&Itemid=1

### Fall 2007
CHS LAN Party, Concord, NH
Info: http://stealthstudios.org/lanparty.aspx

### 10.24.07
LAN OC, Ohio City, OH

### 10.26.07
Frag Your Brains Out, Richmond, KY

LAN-O-THON v4.0, Tampa, FL
Info: http://lan.mcdportal.com

theGXL, millville, NJ
Info: http://www.thegxl.com

### 10.27.07
Peace Love and Rockets, Arlington, TX

Appalachian State University Gaming Club, Boone, NC
Info: http://www.gaming.appstate.edu

Carolina Armageddon, Gastonia, NC
Info: www.carolinagaming.com

### 11.02.07
AdrenaLAN, Pooler, GA
Info: http://www.supreme-evil.com

DAK LAN, Yankton, SD
Info: http://www.daklan.org

Maryland LAN Gamers, Westminster, MD
Info: http://www.marylandlangamers.net

### 11.10.07
NWALAN, Rayetteville, AR

### 11.17.07
MadLAN, Waterford,MI
Info: http://www.madlan.net

NEARFF, Searcy, AR
Info: http://www.harriscustompcs.com/nearff

Whempy's LAN Party, Columbus, OH
Info: http://whempys.com

### 12.01.07
Intel LanFest: Sacramento II, Sacramento, CA
Info: http://www.sac-lan.com

### 12.14.07
East Coast LAN, Chesapeake, VA

### 01.05.08
Whempy's LAN Party, Columbus, OH
Info: http://www.whempys.com

### 01.26.08
Carolina Games Summit, Goldsboro, NC
Info: http://www.CarolinaGamesSummit.com

### 02.23.08
Appalachian State University Gaming Club, Boone, NC
Info: http://www.gaming.appstate.edu

### 03.07.08
Digital Overload, Providence, RI
Info: http://www.digital-overload.com

### 04.19.08
Appalachian State University Gaming Club, Boone, NC
Info: http://www.gaming.appstate.edu

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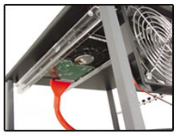
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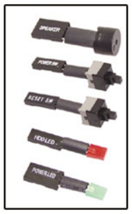
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# Technically Speaking

## An Interview With Ginny Redish, Author & Web Consultant

Ginny Redish is president of Redish and Associates in Bethesda, Md. She is a consultant who helps clients create better Web sites through understanding their business goals, the people who come to their sites, and the conversations those people want to start. Details about her new book, "Letting Go Of The Word: Writing Web Content That Works," can be found at www.redish.net/writingfortheweb.

**by Barry Brenesal**

**CPU:** Some of our readers are probably aware of the field of usability. Others, though, are not. So, could we start with a definition?

**Redish:** Usability is an attribute of any product: software, hardware, Web site, even a paper document. Usability refers to how well the product works for the people who have to use it. A usability consultant is someone who helps a team that is creating that product make sure that it works as well as possible for the users.

The activities that a usability consultant helps with can start before the product is even developed, when it's only being thought about. Then you would go out and understand how people who are the relevant audience do the kind of work the product is meant to support. An early usability technique is a field study in which we actually do very much what an anthropologist would do: watch people in their environments.

Some other activities come a little later in the process, helping to make sure that prototypes in development—even very early designs—are going to be appropriate for the people who would use the product. We often begin with an informal usability test. That means inviting people who are relevant potential users to try it out, doing real behavioral work, real tasks with the product. Usability consultants know that you create the most successful product by not waiting very late in the project to do testing. Do it early, and often.

**CPU:** It sounds as though usability should always have been of importance in the creation and development of software and hardware all along. But that hasn't been the case. When did usability consulting become an important profession in the computing field?

**Redish:** You're right: Usability, or the lack of it, is always an attribute of a product. People who help you get good usability for your product should always be part of the project. But in the early days of technology, it was all such an exciting advance, and the technology went to people who were willing to put up with difficult-to-use products for the benefits the technology brought them. As technology has gotten to be more a part of our lives and products got beyond what are called "first adopters" to a more general audience, then usability became much more important.

The Usability Professionals' Association was founded about 15 years ago, but there were people doing usability even before that. The profession is growing by leaps and bounds today. That is primarily because of the Web and because so much software is being turned into Web-based applications. They are going to a much broader audience than before.

**CPU:** Is it your perception that the Internet could benefit from more usability consulting?

**Redish:** A lot of Web sites could be greatly improved, in part because people are still thinking about them from the viewpoint of the technology or the content, rather than the human beings who use them. We all tend to assume that everybody else is just like us, but that's not true. If you're a programmer, you're probably very intrigued by and knowledgeable about the technology. But you could be creating a product for people who only care about getting their work done as quickly and easily as possible. They don't know or want to know the ins and outs of your specific technology.

A good analogy is your car. The people who design cars are probably all into how everything fits and works under the hood. But most people who get a car are only interested in driving it.

Usability consulting is about helping programmers, or Web content writers, get into the heads of the people on the other side of the dialogue. Because every product is, in fact, a dialogue—between the product and the person who is trying to use it.

**CPU:** You didn't begin with a degree in usability consulting. You were in linguistics. What got you involved in the other field?

> A lot of Web sites could be greatly improved, in part because people are still thinking about them from the viewpoint of the technology or the content, rather than the human beings who use them. —Ginny Redish

**Redish:** I really enjoyed my graduate work and my doctoral studies in linguistics. But linguistics is a fairly esoteric field. If you're not going to become a professor, the question is, what do you do? I ended up, for personal reasons, in the Washington, D.C., area, where there are a lot of think tanks. I was in the right place at the right time when the federal government got very interested in what's called "plain language"—that is, communicating clearly with people. It was a question of how do you make a form, a user manual, a government regulation, a product that people can use. Because in all products, the issues are: Can people find what they need? Can they understand what they find? Can they use what they understand appropriately to accomplish their goals? That's a definition of plain language, of good documents, of usability. I became one of the early usability specialists. My team worked on projects for IBM, Hewlett-Packard, and others in the early days of the PC.

**CPU:** You just mentioned Hewlett-Packard. Your corporate clients have included Boeing, GTE, IBM, Capital-One, Intel, and Sony. These are not organizations noted for failure to produce materials that communicate clearly and effectively to their users. What sort of help did they ask you for?

**Redish:** In about 1982, a vice president of IBM called me and said something like, "We're about to put a computer on the desk of every executive in America, and we don't know how to communicate with those people. We've always communicated with the system administrator in the back room running the mainframe." In the early 1980s, PC user manuals were command-based reference documents. They told you that if you knew what command to use, here was the syntax and all the optional attributes you could add. But these companies had never written what is today a typical user manual; that is, one that is organized by the tasks that people want to do.

**CPU:** You've also been involved in usability consulting for Web sites.

**Redish:** Yes, my current practice is entirely about Web sites. One of the interesting things about many Web sites is that they are primarily information-based rather than application-based—though I also do work on Web applications. The information-rich Web sites bring my clear writing back to the fore, because, again, I think a Web site is a conversation started by a very busy person who comes there, saying, "I need an answer to this question."

But many Internet sites are not developed in that frame of mind. They are developed by people who think, "I have to tell people all this stuff about who we are." There's a mismatch in the conversation here. In many cases, people don't want to have to know which division of a company to go to. They just want an answer. It's that mismatch that I help clients understand, and that understanding leads to revising their Web sites.

**CPU:** I read a white paper of yours entitled "Lessons Learned from Web Site Usability Testing" that you gave at the 2005 Society for Technical Communication Conference. You summarize a variety of important facts for Web site owners and system operators to keep in mind, while seeking interaction with users. Could we perhaps go over those points briefly?

**Redish:** Certainly.

**CPU:** "Users are goal-oriented and topic-oriented."

**Redish:** In my corporate training workshops, I always start by having people take off their professional hats and put on their hat as users of other people's Web sites. Then they tell their neighbors a story about going to a Web site. All their stories are about people having a goal, a need they had to satisfy—whether it was buying something, or wanting the answer to a question, or getting support information because something had gone wrong with a product.

*We will continue with part two of this interview with Ginny Redish next month.*

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Subscribers can read bonus content with Ginny Redish at
www.cpumag.com/cpunov07/redish

by Kristina Spencer

# Under Development

A Peek At What's Brewing In The Laboratory

## 3D Images You Can Touch

The first time you gazed at a high-definition display, you may have thought to yourself, "Wow, that image looks so real; I feel like I could reach out and touch it!" What if, one day, there was a display that let you turn that perception into reality?

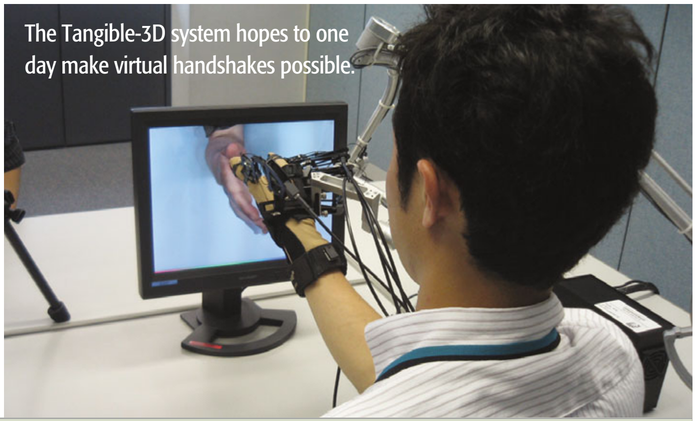
Reasearchers at NTT Comware in Japan have developed a prototype of just such a system. Called the Tangible-3D display, it utilizes 3D display technology along with a haptic glove to create the experience of physically interacting with realistic 3D images. The glove provides a tactile sensation that makes you feel like you're touching solid objects.

The display projects slightly different images to each of the viewer's eyes to create the illusion that an object is floating just in front of the screen, precluding the need to wear special glasses. Then the glove translates tactile data about the object, such as size, shape, density, and texture, into pressure sensation and transmits it to the user.

The Tangible-3D system also captures and transmits live video and lets the viewer interact with it in real time. Two cameras on the transmitting end capture the image, which Tangible-3D then translates into 3D data and projects to the viewer on the receiving end. When the filmed subject moves, the user feels that movement via a haptic glove.

Currently, the system only works in one direction, but Shiro Ozawa, one of the NTT engineers who built the Tangible-3D display, tells us that the next step in his research is bidirectional tactile sensation; when two people on either end of the screen shake hands, they will both experience the sensation of grip and movement.

Ozawa believes it will be several years before a commercial version of the Tangible-3D display is possible, but planned applications include a 3D museum experience, where users can pick up and interact with artifacts that would otherwise be off-limits, and a 3D videoconferencing system. ▲


The Tangible-3D system hopes to one day make virtual handshakes possible.

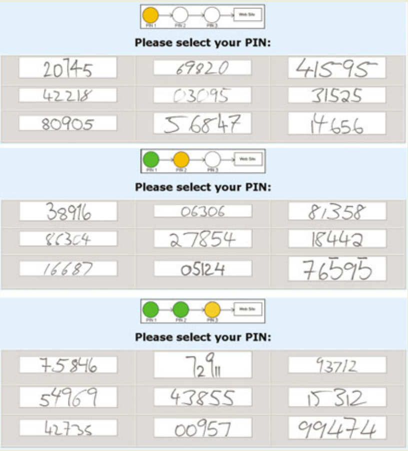
## Handwritten Passwords Could Be The Write Stuff

Trying to remember passwords for dozens of different Web sites is enough to prompt even the most security-conscious user to start taking shortcuts. Using the same password in multiple places, writing passwords down, or choosing a password that is familiar or easy to remember—and thus easy to hack—top the list of security sins.

Now, for the memory-challenged among us, help may be on the way. University of Glasgow researchers are developing a system called Dynahand, which lets a user authenticate by identifying their own handwriting.

In order to use the system, a user submits several handwriting samples consisting of random sets of numbers. The samples are scanned into the system, and the system presents a user with the correct sample mixed with several false samples during a login attempt. Selecting the correct sample (or a series of samples to increase the level of security) results in successful authentication.

Dynahand isn't intended to be a completely secure method to replace strong passwords, says Karen Renaud, the computer scientist who has been working to develop the system. "It is meant to take the load off users to remember a strong password for a site that is low risk, such as chat rooms or other social sites," she says.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| 20145 | 69820 | 41595 |
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| 80905 | 56847 | 14656 |

Please select your PIN:

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| 38916 | 06306 | 81358 |
| 86304 | 27854 | 18442 |
| 16687 | 05124 | 76595 |

Please select your PIN:

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|---|---|---|
| 75846 | 72911 | 93712 |
| 54969 | 43855 | 15312 |
| 42735 | 00957 | 99474 |

Dynahand requires users to identify their handwriting from a selection of samples.

Renaud adds that Dynahand could also be a secondary authentication system. "You could use a password for primary access and then require the person to identify his own handwritten numerals if a transaction that has side effects (such as money transfer) is carried out. This way, the handwritten numerals will not be available to all and sundry on the Web for hacking purposes. It would be used within a site after primary authentication."

Renaud's team is focusing on addressing the system's scalability issues. Because each handwriting sample currently needs to be manually scanned into the system, Dynahand is of limited value for systems with large numbers of users. Once the researchers figure out a more efficient way of capturing the samples, Renaud believes the system will be ready for a commercial audience. ▲

## Switchable Computer-Generated Holograms

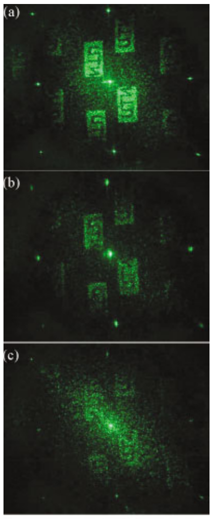
Researchers in Singapore have created a new type of electronically switchable holographic device, opening up the possibility for future devices that could store even larger amounts of data in very small spaces or serve as switchable optical lenses.

The device is the work of Xiaowei Sun and Yanjun Liu, scientists at Nanyang Technological University in Singapore. They created it using PDLC (polymer-dispersed liquid crystal), a lightweight, compact, and easily fabricated material that, because of the presence of the polymer, has a much faster response time than liquid crystal alone.

Sun and Liu encoded a computer-generated hologram using software and one laser beam (rather than the two beams required by traditional holographic technique) onto the PDLC device. A second beam was used to read the stored image. When they applied voltage to the device, the liquid-crystal molecules realigned, effectively "erasing" the data from the device. When Sun and Liu removed current, the molecules returned to their original alignment and the data returned.

Holographic disks can store significantly more data than conventional CDs and DVDs because they allow data to be encoded in three dimensions, but current versions are not rewriteable. Although the switchable hologram that Sun and Liu have created is write-once media, the duo's research lays the groundwork for future versions in which data may be stored in various configurations of the molecules and electrically switched as needed, greatly increasing the storage capacity of the devices.

"This kind of switchable hologram is very promising in 3D displays, data storage, and some optical systems," explains Sun. "For example . . . imagine [a PDLC] switchable lens used in digital cameras; we can change the focal length (zoom in or zoom out) by applying a voltage on the lens, which is very convenient to control it without moving any optical elements." ▲



A hologram recorded in a PDLC device is "erased" as voltage is applied. When the current is removed, the data reappears.

## Videoconferencing Adds A Dimension

It's Monday morning, and you're late for your first meeting of the day. You walk into the conference room expecting a simple videoconference with your overseas coworkers, but instead, you see realistic 3D virtual representations of them sitting around the table, looking very disgruntled to be kept waiting. As you apologize and take an empty seat, you realize this is no ordinary videoconference.

This scenario could come to pass, thanks to the collaborative research of the University of Alberta's Advanced Man-Machine Interface Laboratory, Canadian research consortium TR Labs, and HP Labs.

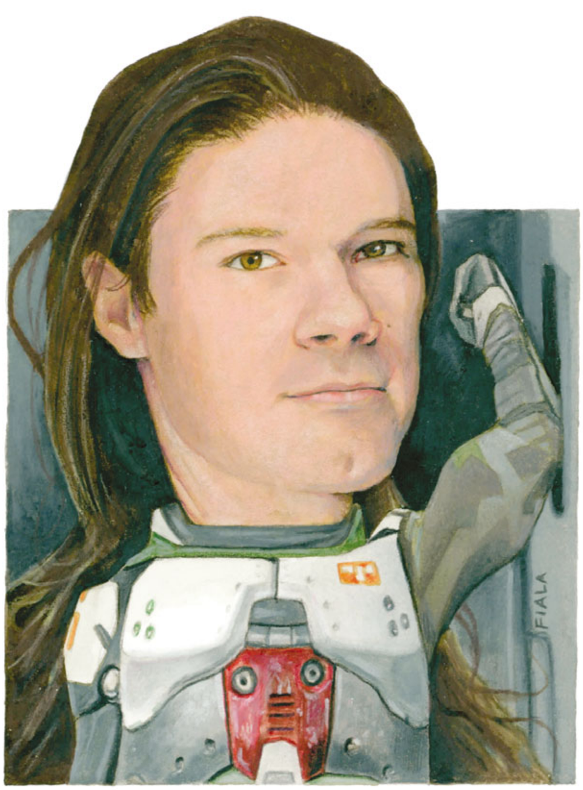
The project under development, called iTRANCE (Immersive Telepresence Room ANd [sic] Collaborative Environment), will take virtual teleconferencing beyond what is known today as "telepresence," a 2D technology in which multiple cameras, screens, and a high-speed network create the illusion of meeting attendants being in the room together, to "tele-immersion," a 3D virtual reality experience that creates the illusion of participants actually meeting in a virtual space.

The system makes use of 3D display technology so that instead of seeing other meeting participants on a video screen (giving the impression that you're seeing them through a window), their life-sized images will appear in front of the screen as though they are in the same room. In action, the technology could resemble such sci-fi creations as Jedi Council meetings in "Star Wars," where some Jedi attended via hologram.

While first applications will be in the business world, eventually the technology could make its way into the home, providing the ability for personal virtual teleconferencing. Published reports estimate that the technology could make its debut as early as this month. ▲

Tele-immersion will let people meet in a virtual 3D meeting space, giving the illusion that they're all in the same conference room.

# Q&A With Todd Hollenshead



Todd Hollenshead started life as a tax accountant. But the gamer in him has won out. In 1996, he became the chief executive officer of id Software, replacing Jay Wilbur, who is now at Epic Games. Since that time, id has grown up, and Hollenshead provides the adult supervision that once seemed sorely lacking at the legendary company. No other company in the game industry has remained so small yet loaded with game-making talent. Thanks to the graphics wizardry of John Carmack and the art teams led by Kevin Cloud, id's games have always been on the cutting edge. At the recent QuakeCon conference in Dallas, id made a flurry of announcements—including the new game Rage—that prove Hollenshead and his team have been busier than ever cooking up new delights for hardcore gamers.

Q **How was QuakeCon?**

TH My impression of it, still in the blast radius of the event, is that it was the best one we've ever had. Our opinion of it will continue to rise the more distance we get. The tournaments were awesome. We had really great attendance.

Q **What did you say about Rage?**

TH Quite a bit. We had a short trailer. John went into a fair amount of detail of the technology, the game design differences, how we're doing Rage versus what we did previously. We have a different game design philosophy. We didn't go into too much about the details. We did say it is going to be a multiplatform game. PC, Xbox 360, PS3, and Mac will all effectively be the same time frame. Those are four platforms all mixed in at the same time. Some of the visuals we showed, including at John Carmack's address at the Apple Worldwide Developers Conference. The core of the game is a first-person shooter. But because we can do all sorts of other things, we are expanding what we can do that's fun in a game. Creatively, as a company, we have wanted to do that, as well. We still think of ourselves as first-person shooter game makers, killing bad guys with cool guns in combat. People know we can do that well from a visual standpoint. Maybe people were skeptical about what we could pull off, like brightly-lit areas, vast outdoor landscapes, and racing activities within a game.

Q **We saw the presentation at the WWDC. You didn't show that much of the game.**

TH Actually, everything you saw there was production assets. That was all in-game content that we showed. It was a camera moving through a landscape. This time we showed some of the same content. It was a better look at the race track. Just a little hint of the story. The setting is post-apocalyptic. A comet has hit the earth. It has fractured society, and society is trying to recover. There is a settlement and a wasteland. In this game, government isn't necessarily a good thing. The lines are blurred. You are an outsider coming in to help the settlements band together and fight the oppression of the regime. You "rage" against the machine.

Q **How many people do you have in the company now?**

TH We are at 38 people total now. That's an interesting segue into another announcement. That includes the start of the second team that we are building internally at id. The second team is working on a project code-named Quake Zero. That's a free version of Quake 3 that you can play through a Web page. We will tap advertising and sponsorship dollars to make the economics work.

Q **You have another movie in the works?**

TH That's right. We are in the process of putting the final ink on the licensing of the Return To Castle Wolfenstein rights to Samuel Hadida and his Davis Films Group. He will produce the project. He worked on last year's "Silent Hill" movie. We'll also have the Academy Award-winning writer Roger Avary. He will write and direct the movie. He was behind "Pulp Fiction" and "Rules Of Attraction" and "Beowulf" coming up.

Q **Was there a lesson from the Doom movie?**

TH We always try to get better and be smarter about doing stuff in the future. Doom was the first id property to be made into a movie. We didn't know anything about the business. I am not saying I am an expert, but I have experience now. With "Doom," we had a good writer with talent in David Callaham but he didn't have a lot of experience. With Roger, he has an Academy Award for creative writing talent. ▲

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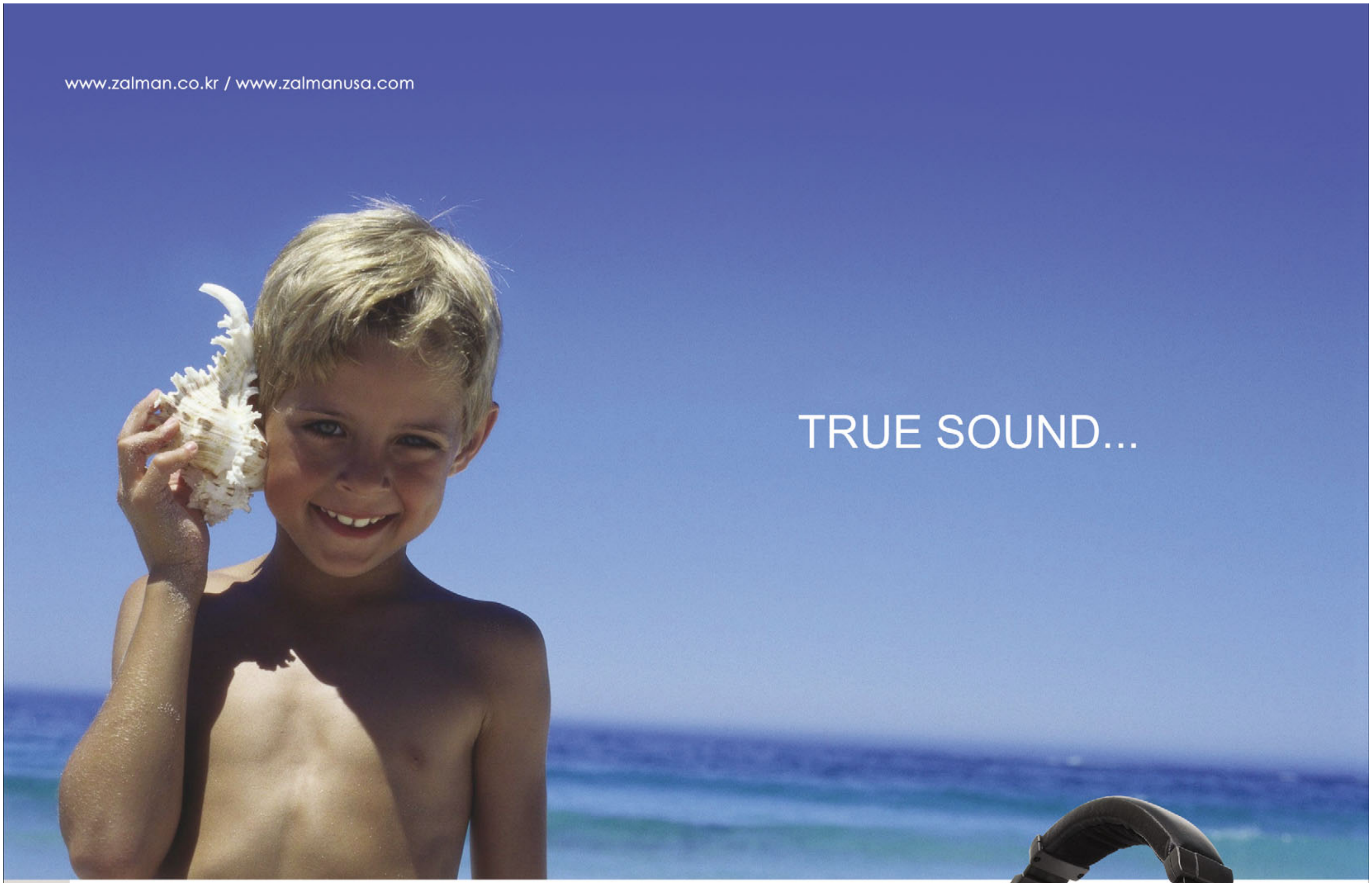

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